

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight.

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## EDITORIAL COMMENT.

### The Army Ban on the Monoplane.

Shortly before the House of Commons rose for the Christmas recess, Col. Seely, in replying to a question regarding the use of monoplanes by the Royal Flying Corps, said that the War Office Committee which was enquiring into the question of the safety or otherwise of the type had practically finished its work and that the report might be expected very shortly. In the light of the unfortunate happenings of the closing days of the old year, we trust that the report will not be much longer delayed, for whether it be favourable or unfavourable to the type, its publication at the present juncture cannot be otherwise than a desirable alternative to the misgiving engendered by the long continuance of the official ban in the Army. Our reference to the happenings of the old year applies, of course, to the deplorable accidents which caused the deaths of Lieut. Parke and Messrs. Hardwick and Petre. It is most unfortunate that both the accidents in question happened when monoplanes were being flown, and it is thus possible that the dog which had already been given a bad name may, as a result, be given a worse. Now, we are not greatly concerned at the moment with the exact local causes, if we may call

them so, of these two accidents. Those will be a matter of inquiry for the Accidents Investigation Committee of the Royal Aero Club, and, until all the evidence has been heard and sifted, they must remain largely a matter of speculation anyway. But, before judgment is passed upon the preliminaries, so to say, it may be as well to point out that, having due regard to all the circumstances, it is impossible to say at the moment that either was caused by any inherent disabilities of the monoplane as such. In fact, there is nothing in the records of either accident, so far as we know at present, to even give rise to the simple thought that any other type of machine would have behaved better under the circumstances of wind and weather. Indeed, if we consider the accident in which Mr. Petre lost his life, it is possible to hazard the opinion that on such an occasion every square foot of wing area was a handicap. But we do not desire to enter into argument or comparison, which can really lead us nowhere in particular—our purpose is simply to indicate that there is at the moment no ground whatever for assuming that the two accidents which saddened the end of 1912 have left the case for or against the monoplane *qua* monoplane with any different aspect than it bore at the time the War Office Committee was appointed after the autumn manœuvres. There is, on the surface, no more evidence to go to the Committee as a result of these occurrences, and there is, therefore, no logical reason why the issue of its report should be delayed on their account. In the interests of the country and of the industry, the report should be made available at the earliest possible moment, so that we may know where we stand with regard to the matter. If the monoplane is to be banned altogether—which we cannot conceive to be possible—then we should know it at once. If the Committee considers that it needs improvements along certain definite lines, and is able to indicate them, then the sooner we know what those lines are the earlier we shall be able to set about the work of improvement.

### Coroners' Juries and Aviation Accidents.

It is a common practice for coroners' juries to add riders, of one sort or another, to their verdicts. Sometimes these riders contain a great deal of common-sense, while, on the other hand, they often trench upon matters of which the jury individually or collectively know nothing at all, and thus they simply achieve the end of making those whose work they are look ridiculous in the eyes of people who know

something about the subject under review. Of the latter variety is the rider added to the verdict of the jury which assisted in the enquiry into the fatal accident in which Lieut. Parke and Mr. Hardwick lost their lives at Wembley. After finding that the two aviators met their deaths accidentally, the jury went on to express the opinion that officers of the Royal Flying Corps ought not to be allowed to make experimental flights without the express permission of the authorities. No one can deplore these too frequent accidents, which lose us our best flying men, more than ourselves, but we cannot help regarding such expressions of opinion as that we are discussing as being sheer futility and an attempt to defeat the real ends for which the Royal Flying Corps exists. It would be unwise in the highest degree to place any obstacles in the way of officers flying when and where they please, within the limits imposed by the exigencies of the Service, and we are perfectly confident that every officer of the Corps will be at one with us in the expression of this opinion. It is even more essential that the military aviator should have a free hand as to his discretion to take advantage of opportunities that may occur for making these so-called experimental flights than that the civilian flying man should have no bar erected before his enthusiasm for the science. The one flies because it pleases him, the other because

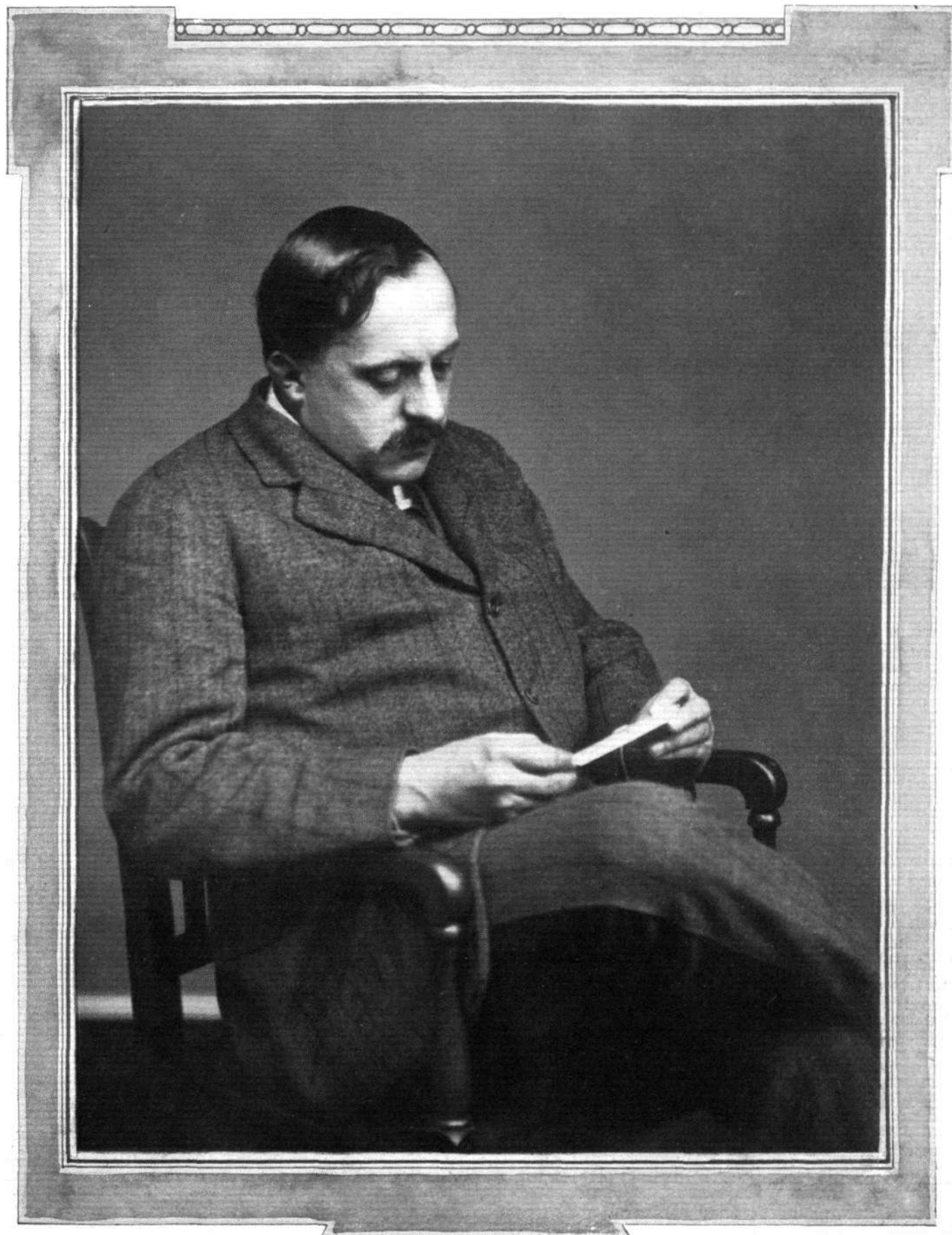
he has devoted his life to a particular branch of the country's service which involves extraordinary risks at all times. In the day when we find ourselves at war with a first-class military power we shall want our men to be better than the best on the other side, and they will not reach that stage in peace if they are to be hampered by all kinds of red-tape restrictions imposed at the behest of soft-hearted jurymen.

In questions of this sort it will not do to allow sentiment to blind us to the facts. The salient point is that the officers and men of the Royal Flying Corps can only learn to fly in one way—by flying, and that under every condition of wind and weather in which the individual officer considers it safe and advisable to venture into the air. We are speaking now of these flights which the jury called "experimental," and not of flights undertaken in obedience to the direct orders of superior officers. With the latter we have no concern, and must not be taken as discussing them at all, because they come within an entirely different category as a part of the routine work of the Corps which it is outside the province of the civilian layman to advise upon. The single point upon which we desire to insist most strongly is, that the very fullest freedom of action should be accorded to the individual who is striving to make himself a thoroughly efficient unit of the country's system of defence.



**THE BRISTOL MONOPLANE IN ITALY.**—A remarkable photograph of Mr. C. H. Pixton, piloting one of these well-known monoplanes, gliding down to earth at sunset at Mirafiori, near Turin. On the left of the picture can be remarked the rising full moon.

MEN OF MOMENT IN THE WORLD OF FLIGHT.



F. W. LANCHESTER, M.I.C.E., Member of the Advisory Committee for Aeronautics, and Author of "Aerial Flight," the standard English text-book on Aerodynamics.



## CHRISTMAS FLYING AT HENDON.

NOTHING less than a raging tempest will stop them flying at Hendon! And this was about the state of the weather last Bank Holiday, otherwise there would have been flying from 11.30 a.m., as a fine programme had been arranged by the management. On the Saturday and Sunday before Christmas Day, however, some very good work was seen, while several fine flights were made last week-end in spite of the gale that was blowing both Saturday and Sunday.

About 18 flights were put up on Saturday, the 21st ult., Louis Noel being the first up at 2.45 p.m. on the 80-h.p. Farman biplane, taking with him a passenger. He was followed five minutes afterwards by M. D. Manton, who flew the Grahame-White 'bus. At 3 o'clock Noel again went up with a passenger on the 80-h.p. Farman, after which Sydney Pickles made his first flight on the Grahame-White 'bus. It was an interesting experience for him, as the handling of this biplane was, he said, quite different to that of the Caudron biplane. Nevertheless, he made an exceedingly steady flight at about three or four hundred feet, finishing up with a splendid landing.

Marcel Desoutter next ascended on the 50-h.p. Blériot monoplane, while Pierre Verrier and Manton also took the air, the former on the Maurice Farman biplane, with a 75-h.p. Renault engine, and the latter on the Grahame-White 'bus; both remained up for over ten minutes. Noel was away again on the Farman, while the last two were still up, and shortly after M. Richet (who had made an attempt at the British height-record earlier in the day, but had to give up after having reached a height of 1,100 ft. in about six minutes), ascended on a new military Breguet biplane, with a 110-h.p. Canton Unné engine, which is placed in a horizontal position, and drives the four-bladed propeller through gearing. He had with him a lady passenger, and remained aloft for 16 minutes, flying very high over the surrounding country.

Lewis Turner then gave a short exhibition flight on the Caudron biplane, and Sydney Pickles made another flight on the Grahame-White 'bus of about 10 minutes' duration, and at a much greater height.

Verrier also went out again on the Maurice Farman at the same time, so there were then four biplanes in the air—the Breguet,

the Caudron, the "G.-W." 'bus, and the Maurice Farman. The engine of the Breguet is comparatively silent, especially when throttled down, which seems strange after the noise these engines usually make. Shortly before 4 o'clock, Noel made a short passenger flight on the Farman, and as he came down Desoutter got away on the Blériot and flew round about the neighbourhood at varying heights for about 12 minutes. During this latter flight, Manton and Verrier each put in a final flight on their respective machines—the Grahame-White and the Maurice Farman biplanes. Several trial flights were made throughout the afternoon by Capt. Deroye and Lieut. Porte on new British-built Deperdussin monoplanes.

The next day, Sunday, was fine with very little wind, and a good attendance. Several very fine flights were made, all of them being of much longer duration than usual. Verrier was up over the outlying country at 1,000 ft. on the Maurice Farman with a passenger. Louis Noel took several passengers on the 80-h.p. Farman, at one time taking Sydney Pickles with him to Wembley, over the spot where Lieut. Parke and A. Hardwick were killed, finding the atmosphere very tricky at this particular place. Other flights were made by Marcel Desoutter on the Blériot monoplane and by Lewis Turner on the 60-h.p. Anzani-Caudron biplane.

As we previously mentioned, Bank Holiday was a blank day owing to the terrible weather, while on the Saturday after it was not much better, the wind blowing in gusts of about 40 miles an hour. But for all that, two exceedingly plucky and daring flights were made by Marcel Desoutter on the 50-h.p. Gnome-Blériot monoplane, and Louis Noel on the 80-h.p. Farman. Both aviators had a very rough time of it, and it was a relief to everyone when they landed safely. Enough is as good as a feast, they say, but aviators appear to think otherwise, for the next day, with the weather about the same, both Desoutter and Noel went out again on their machines. The former reached a height of over 2,000 ft. and then the oil pipe broke, so he had to stop his engine and *vol plané* to earth. It was a remarkable descent, for as he was facing the wind, he only moved forward a very little, so he seemed to be "pancaking" nearly the whole time. Noel, also, had engine trouble, but was fortunately able to effect a safe landing.



### ROYAL FLYING CORPS.

THE following appointment was announced in the *London Gazette* of the 20th ult. :—

**Military Wing.**—Second Lieut. Alan Hartree, Royal Artillery, is appointed to the Reserve. Dated December 21st, 1912.

The following appointment was announced in the *London Gazette* of the 25th ult. :—

**Military Wing.**—Second Lieut. (on probation) Geoffrey de Haviland is confirmed in his rank.

The following appointments were announced by the Admiralty on the 27th ult. :—

Lieuts.—J. W. Seddon, to the "Actæon," as Flight Commander, Royal Flying Corps, for charge of Isle of Grain Air Station; S. D. A. Grey, to the "Actæon," additional, as Flight Commander, Royal Flying Corps; C. J. L'Estrange Malone, graded as Flight Commander, Royal Flying Corps; F. L. M. Boothby and H. L. Woodcock, to the "Actæon," additional, as flying officers, Royal Flying Corps (Airship Section). Dated December 31st, 1912. J. T. Babington, to the "Actæon," additional, for aviation course at Eastchurch. Dated January 3rd, 1913.

Assistant-Paymaster E. B. Parker, to "Actæon," additional, for aviation course at Eastchurch. Dated January 3rd, 1913.

**Royal Marines.**—Capt. R. Gordon (R.M.L.I.), to the "Actæon," additional, as Squadron Commander, Royal Flying Corps. Dated December 31st, 1912.

Lieut. T. S. Creswell (R.M.L.I.), to the "Actæon," additional, for aviation course. Dated January 3rd, 1913.

The following appointments were announced by the Admiralty on the 31st ult. :—

Lieuts. H. D. Vernon, R. P. Ross, J. R. B. Kennedy, and D. A. Oliver, to the "President," additional, for aviation course at Central Flying School, to date January 17th.

**Royal Naval Reserve.**—Lieut. F. W. Bowhill and Sub-Lieut. A. W. Big-worth, both to the "President," additional, for aviation course at Central Flying School, to date January 17th.

**Royal Marines.**—Lieut. C. E. H. Rathborne, to the "President," additional, for aviation course at Central Flying School, to date January 17th.

**Royal Naval Volunteer Reserve.**—Sub-Lieuts. R. L. G. Marix and H. A. Littleton, to the "President," additional, for aviation course at Central Flying School, to date January 17th.



### AN "EXTRAORDINARY OCCURRENCE" TRULY.

MR. D. LAWRENCE SANTONI, Managing Director of the British Deperdussin Aeroplane Co., Ltd., writes us as follows in regard to the following extraordinary occurrence which took place at the London Aerodrome, Hendon, on Sunday morning, Dec. 22nd, 1912.

"Lieut. J. C. Porte, R.N., was flying a Military two-seater aeroplane, with 100-h.p. Anzani engine of the same type as won the second and third prizes in the recent British Military Trials on Salisbury Plain, with a distinguished naval officer as passenger. After a half circuit of the aerodrome the engine suddenly stopped, when Lieut. Porte was 150 ft. over the trees surrounding the aerodrome, and it was only by great skill that he managed to just land a couple of yards inside the aerodrome fence.

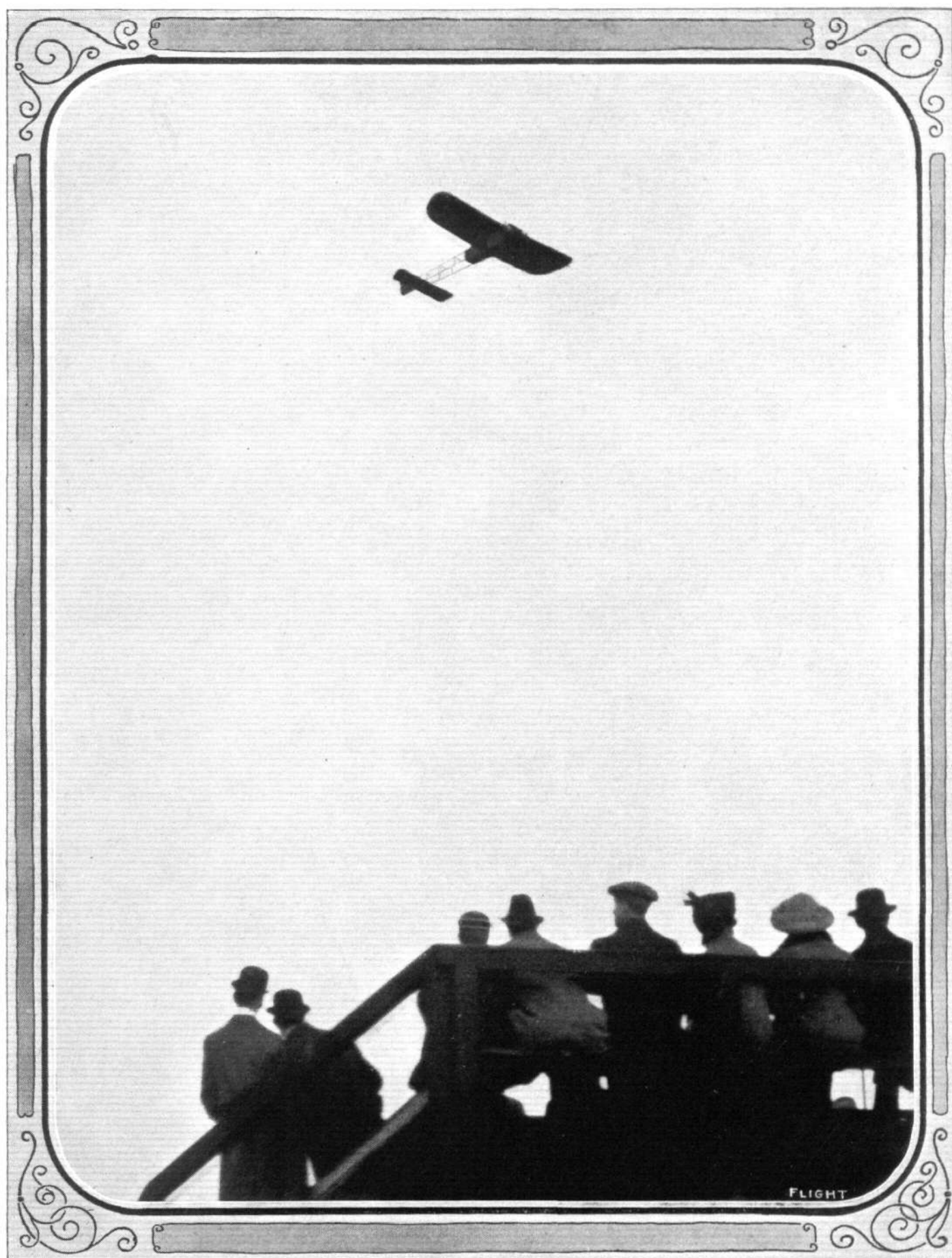
"Had the engine stopped five seconds before, he would have had no alternative but to come down on the trees, when the machine would have been wrecked, most probably with the loss of his and his passenger's life.

"The engine was immediately examined, and it was found that all the working parts inside were completely smashed. On dismantling the engine, a small steel nut which was no part of the machinery, was discovered in the crank-case; this nut had jammed up the connecting rod, causing the pistons to break and completely destroying the engine. This nut could by no possible means have got inside the engine except by wilful design, and to place the nut in the crank-case one cylinder must have been dismantled, which operation would have taken about a quarter of an hour. This outrage is the more abominable that the cowardly hand must have known that Lieut. Porte seldom flew on that machine alone, generally taking a passenger. His escape is one in a thousand, especially on that morning when a nasty wind was blowing, making the conditions all the more dangerous.

"On the day previously, Saturday, December 21st, 1912, the same machine flown by Lieut. Porte, and another military two-seater British Deperdussin monoplane flown by Monsieur Deroye, the chief pilot of the Italian Deperdussin firm, had both been tampered with, the carburettor on each machine having been filled with water. This further extraordinary occurrence all the more accentuates the deliberate nature of the outrage. Had the machines been flown by others than experts, fatal accidents might also in this case have easily happened.

"This serious matter has been placed in the hands of the Royal Aero Club for thorough investigation."



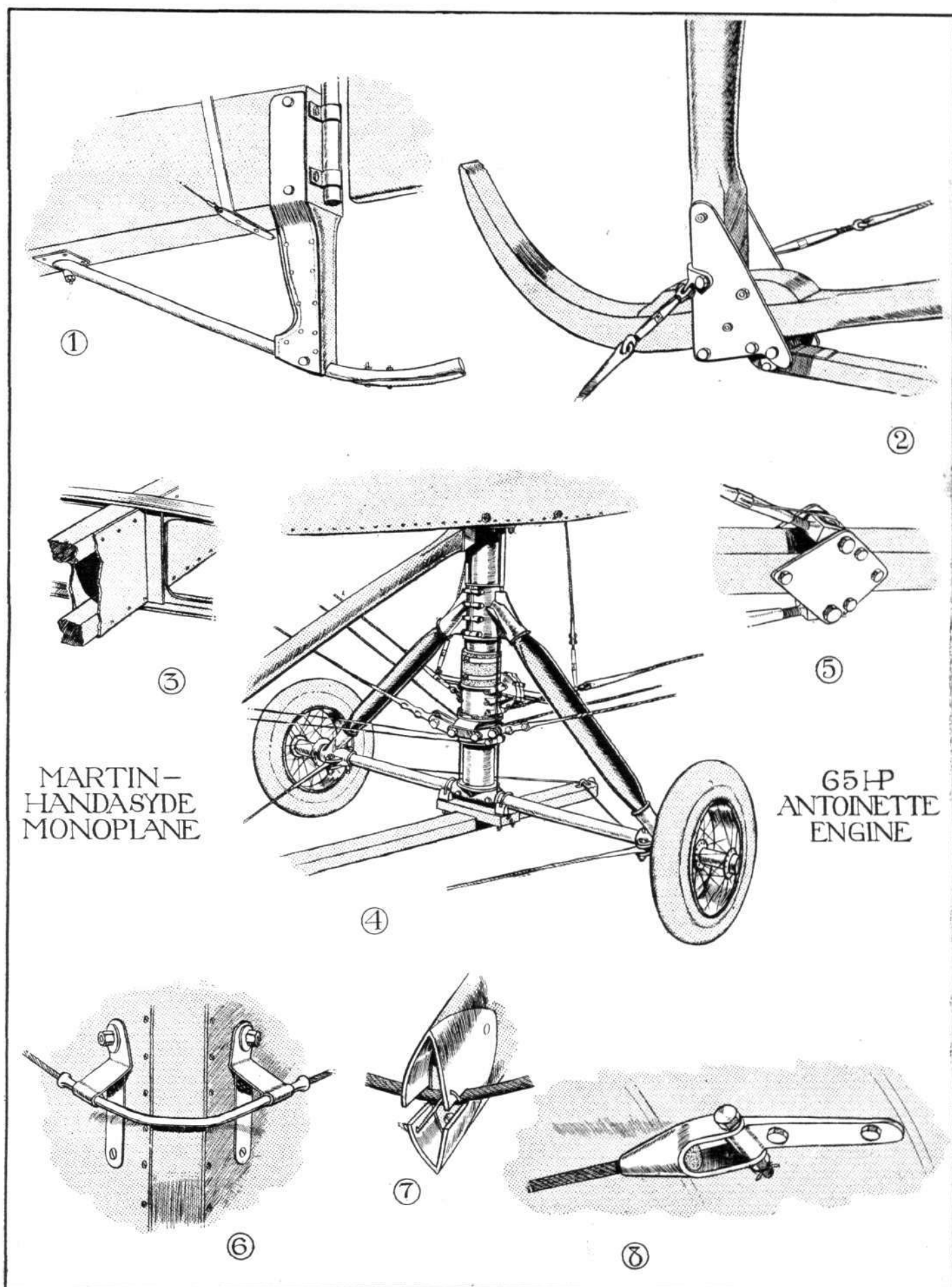


MARCEL DESOUTTER FLYING AT HENDON ON SUNDAY.—At an altitude of 2,000 ft. the oil pipe of his engine broke away, and a dive, heading a 45-mile wind, resulted in a parachute-like descent in perfect safety, but taking several minutes to finish. Our picture shows Desoutter on his Blériot starting to climb.

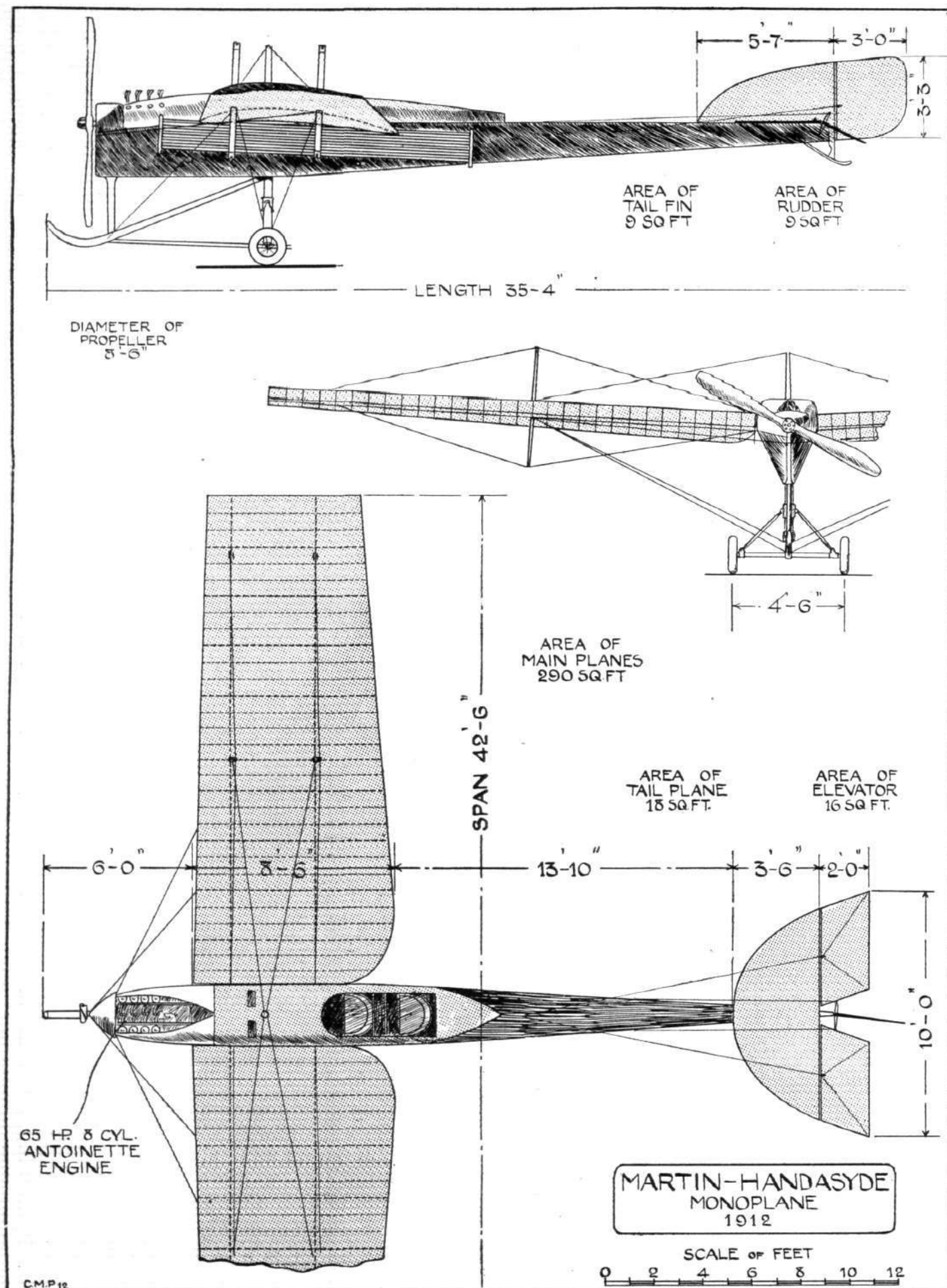


THE MARTIN HANDASYDE, as seen from different points around the machine.





DETAILS OF THE MARTIN-HANDASYDE MONOPLANE.—(1.) The tail skid. (2.) The front skid. (3.) The construction of the wing spars. (4.) The landing gear and wing-warping mechanism. (5.) The anchorage of the chassis-staying cables. (6.) The fitting accommodating the cable which braces the wings against drift. It passes round the nose of the body. (7.) The king-post tip. (8.) One of the strong cable fastenings that are used on the cables taking the main lift.



THE MARTIN-HANDASYDE MONOPLANE.—Front and side elevations and plan to scale.



## THE MARTIN-HANDASYDE MONOPLANE.

SINCE the very early Brooklands days, when they were experimenting with an extremely pretty light monoplane, with a 35-h.p. J.A.P. engine, Messrs. Martin and Handasyde have kept firm to a design greatly resembling the Antoinette. Yet, although the Antoinette has lived its day, and now has almost died out, these two enthusiasts have gone forward, keeping true to their faith in their design, to a successful issue. No one will deny that the Martin-Handasyde monoplane as it stands to day is decidedly good as a flying machine, and one of the two prettiest monoplanes that are built in England.

In passing, there is an uncommon interest in the fact that this monoplane is driven by an Antoinette motor. Back in the days when there were more Antoinette monoplanes about than there are now, many were the attempts to get these machines to fly satisfactorily with a different engine. Gnome, E.N.V., and other motors were tried, but the results obtained were not comparable with those arrived at when the Antoinette motor itself was fitted. There seemed to have been a conspiracy between the two, the machine refusing to be put on its best behaviour unless it were companioned by the motor that was designed for it. It may be pure coincidence, it may be something to do with the fact that the same brain, M. Leon Levavasseur's, devised the two. And in support of this phenomenon, or whatever one likes to call it, we find that Mr. Handasyde, having in the course of his experiments fitted his machines with both J.A.P. and Gnome motors, returns to the Antoinette.

Whatever different opinions have been held in the past relative to the general design of the Martin-Handasyde machine, and it may be as well to remark that no machine ever appears in the aerodrome without giving rise to most conflicting opinions as to its worth, everyone has been unanimous in writing down the designer as one who is unusually clever at detail work, and enormously particular regarding the standard of workmanship that he demands from his working staff.

The backbone of the machine is a girder, of a section that may be likened to a triangle standing upon its truncated apex. It is its widest in the neighbourhood of the seats, and tapers away to either end like a boat. Its construction is interesting, for it is not built up in the usual manner with piano-wire bracing and transverse struts. There are four *longerons* of ash, which taper towards the tail. These are clamped down to a mould, and to them are screwed sheets of three-ply wood, from which, afterwards a diamond shaped piece is cut for lightness sake. Forward of the passenger's seat these sheets of three-ply wood are left solid, for there greater strength is required. The

sheets having been applied, the *fuselage* is removed from the mould, covered with fabric, and doped, and the result is a body that is simple to construct, that is light, and that is extremely strong against longitudinal bending and lateral torsion.

The landing gear is quite Antoinette in its appearance, but in its action, quite different, for elastic shock absorbers are employed, whereas the Antoinette rejoiced in a compressed air suspension. The weight of the whole machine is taken in a single large diameter steel tube that is built into the body at a point just forward of the centre of gravity when the machine is fully loaded. Landing shocks are absorbed by the tube travelling vertically against the tension of rubber *amortisseurs*. A skid of hickory, shaped like a hockey stick, extends forward below the propeller to protect it, and in front is supported from the body by a stout ash strut.

Everything about the chassis strikes one as being very strong, and the same remark applies to the wings. They are each most intricately constructed about two hollow spars built up of ash and three-ply wood. At the wing root the front spar has a depth of 7 ins. and the rear one



Wing section, to scale, of the Martin-Handasyde monoplane.

6 ins., and they both taper to 3 ins. at the tip. Both are rigidly braced by spruce king-posts and stranded steel cable. For their shape they taper towards the tip, and there is noticeable a progressive "wash-out" in the camber. Covered and varnished, each wing weighs about 110 lbs.

So that the engine shall offer as little head resistance as possible, it is covered right in by aluminium sheeting, and the lines of this covering are continued on to a point to the rear of the pilot's seat by a fabric-covered superstructure of spruce and three-ply wood.

On either side of the body are the aluminium condensers, 13 ft. 6 ins. long, that recover the steam, which is formed in the cooling-jackets of the motor. They are most extraordinarily light, for the pair only weigh about 9 lbs., and have a cooling surface of nearly 70 square feet.

The tail of the machine takes a little share of the total lift, for although it is flat on the undersurface, it is cambered on top. Elevation is controlled by tail flaps. The motor, turning a Regy propeller of 2 m. 60 diameter and 1 m. 40 pitch at 1,150 r.p.m. on the ground, develops 60-h.p. at 1,300 r.p.m. in the air. She flies at 64 miles per hour.

## THINGS WE SHOULD LIKE TO KNOW.

WHEN the light railway from Weybridge Station to the sheds is likely to be started.

If it is not a fact that a lot of good work is going on in a quiet way down on the south coast.

Where the machines are coming from to stock the new aerial coast-defence stations.

Who the dozen or so wrecks at Brooklands belong to.

Are they calculated to impress embryo pupils.

If they are any good, why they cannot be put away, instead of lying all over the enclosure.

Whether it would not be better to have a bonfire.

Whether it would not be as well to take the ban off monoplanes, and get going with some orders.

How Desoutter likes parachuting.

What Noel said when his engine started missing over the sheds, when broadside on, in a 40-mile wind.

If it is true that the motor and other boats at Hendon were in use on Boxing Day.

How Manton liked hovering over the railway for 15 mins., drifting 1 mile an hour backwards.

Whether he had any momentum.

If the visitor to Hendon who said he "liked the one with the two boilers best" was M.I.M.E.

"WILL-O'-THE-WISP."

## THE YORKSHIRE DISASTER.

It is again our sad duty to chronicle the death of another of our most intrepid pilots—to record another life sacrificed to the cause of aviation in this country.

Mr. Edward Petre, flying a 50-h.p. Martin-Handasyde monoplane in a gale on Christmas Eve, fell to earth at Marske-by-Sea, Yorkshire, and was killed.

Briefly, the facts are these. Mr. Petre started from Brooklands at a quarter past nine o'clock in the morning, intending to make a non-stop flight to Edinburgh. He had, it appears, set himself the task of flying from London to Edinburgh before Christmas. He was delayed by one cause and another until the very last day that was open for him—Christmas Eve. The wind that morning at Brooklands was blowing with considerable force, and while it was generally considered safe for experienced pilots to make short flights within the confines of the aerodrome, almost everyone there was of the opinion that the conditions were not suitable for such a long flight as it was Mr. Petre's intention to carry out. But he started. After all, it is not difficult to understand. Mr. Petre was a pilot of exceptional ability and experience, he had the utmost confidence in his machine, he had confidence in himself, and he had—true Britisher that he was—indomitable pluck and courage.

It is more than likely that all would have gone well with him had the weather conditions remained constant throughout the trip. But as he proceeded up north, the wind became more and more violent, until at the time he reached Marske, where the fatal accident occurred, it had attained a velocity, we have been assured, equal to the flying speed of his machine.

How can anyone but admire, whilst under the circumstances regretting, Mr. Petre's pluck in fighting on and on, in spite of the ever-increasing violence of the wind; struggling on in the determination, come what may, to achieve his aim?

Approaching Marske he flew into a zone of wind so violent that he evidently decided his best course was to land.

For the accident, we cannot do better, until the Accidents Investigation Committee of the Royal Aero Club publish their report on the cause of the fatality, than to place forward the conclusions arrived at by Mr. Martin, collaborator with Mr. Handasyde in the design of the monoplane Mr. Petre was flying, after a thorough investigation on the scene of the accident.

"Evidently," Mr. Martin has told us, "Mr. Petre found himself drifting out to sea in a westerly wind, and, being unable to fight against it, eventually tried to land downward on the sands. From marks on the sands, and from the reports of eye-witnesses of the occurrence, it is established that he did make successful contact with the ground. But his front skid must have struck the ground too heavily, and undoubtedly this had the effect of bringing down the tail suddenly, and so setting his wings at a course angle to the wind. Unable to check the machine, he apparently was carried into the air to a height of about 40 feet, where, losing his flying speed, and consequently his control over the monoplane, he slipped sideways and came heavily to earth."

It has been reported that before the final fall he was seen to raise his hands as if in despair. Knowing Mr. Petre's character, we immediately passed this on one side as being too absurd to think of. If he took his hand from the control it was undoubtedly to lift his goggles clear of his eyes—a habit he had when preparing to land.

Such, then, was the sad ending to a flight that will be written down in the annals of aviation as one of the most masterly accomplished in the year one thousand nine hundred and twelve.

Edinburgh from Brooklands is approximately 350 miles as the crow flies. Reaching Marske, Mr. Petre had covered over 250 miles of the journey—and under such terrible weather conditions.

We mourn our loss, but we glory in the memory of a hero, a true sportsman, and an ardent and practical enthusiast.

At the inquest, which was subsequently held, a verdict of "Accidental death" was returned, the Coroner remarking that it was clear that the disaster was brought about solely through the very heavy gale that was raging. The funeral took place on Saturday

last at Frying Churchyard, near Ingatstone, where the late Mr. Petre's parents lived. His remains were conveyed on the previous day to the private chapel at Ingatstone Hall, where they lay in state throughout the day.

Concluding, we are sure all our readers and all those interested in the cause of aviation, join with us in tendering our heartfelt sympathies to the late Mr. Petre's parents and to his brother, Mr. Henry Aloysius Petre, in their sad bereavement.

To Messrs. Martin and Handasyde, the constructors of the monoplane on which the late Mr. Petre met his end, we also extend our sympathies. They have worked hard and conscientiously for aviation in England, but, through ill-luck, the shadow of two fatalities rests over their efforts during the past year. Whatever was the cause of the accident to the late Mr. Graham Gilmour, it is clear that this last fatality was not brought about by any failing on the part of the machine. Let us rather turn our thoughts to the splendid wind flight that machine made in flying from Brooklands to Marske.

### Edward Petre's Career.

With his brother, Mr. H. A. Petre, the late Mr. Edward Petre joined the ranks of practical aviation enthusiasts soon after Blériot had succeeded in flying across the Channel on his frail aeroplane in the summer of 1909. They set to work and evolved a highly original monoplane, which was shown in skeleton at the Olympia Aero Show of 1910. It aroused considerable comment, for it was most carefully constructed, and embodied the novel feature of having its propeller arranged behind the tail, a disposition that required considerable constructional talent to effect in a workmanlike manner. The machine was afterwards taken to Brooklands, where it was tested. It made short flights, but it was not long before one of the brothers managed to smash it up fairly completely. Thereafter they decided not to rebuild it or recommence on another design, but rather to remain at Brooklands giving assistance to everyone, and all the time to gain valuable experience relating to construction. Here they were exceedingly popular, and soon became familiarly differentiated by nicknames. "Peter the Monk" was Mr. H. A. Petre, and his late brother was "the Painter." Eventually the late Mr. Edward Petre joined Messrs. Handley Page, and although up till then his experience of piloting was only based on his experiments with his original monoplane, and the tips he drew from being a passenger with other pilots on countless occasions, yet he undertook the tuning up and adjustment of the new Handley Page monoplane, up till then a relatively untried machine. For some months these experiments were carried on with great secrecy at Fairlop in Essex, during which time the late pilot attained considerable ability in handling that machine. Although he was fully competent weeks before the time, he made no attempt to get his *brevet* till July 24th of this year, when he carried out the tests with ease.

A little while later, he gave that monoplane a most startling *début* by flying it from Fairlop, through London, following the course of the Thames, to Brooklands. The following month he was at Salisbury for the purpose of piloting a new 70-h.p. two-seater Handley Page machine through the Government Trials. However, the machine not being completed in time, he made no official flights in this connection.

Thereafter, up till his sad death he was engaged by Messrs. Martin-Handasyde to pilot their monoplanes at Brooklands. There, one would often see him flying his machine on days so boisterous that only one or two of the most experienced of his fellow-pilots would venture out. Less than a month ago he carried out the delivery trials of one of these machines at South Farnborough before it was handed over to the Royal Flying Corps. His clever handling of the Martin-Handasyde earned for him and for the machine an enviable reputation. He proved the machine's ability to fly in strong winds. He proved it again on the very day of his death by flying 250 miles under extremely trying conditions. But it is hardly reasonable to expect that any machine at present existing should stand up to a veritable gale.

car. It is hoped that this will not be the only exhibition given by Mr. Hamel, and if it is successful Mr. Hamel will be engaged again.

Besides the flying, there will be a full-sized glider on view. It is also anticipated that the club will have a hangar erected on the ground.

The club is anxious to make itself well known, and one of the strongest in the provinces, and as this can only be accomplished with a large membership, and also with the energy of the members, applications for membership are, therefore, invited by the secretary, at 8, Frederick Road, Edgbaston.

### Birmingham Aero Club Going Strong.

ARRANGEMENTS have now been completed with Mr. Gustav Hamel to give exhibition flights on the club's aerodrome at Billesley Farm, Yardley Wood Road, King's Heath, on Saturday, January 11th. The exhibition will start at about 2.30 p.m. Admission, 6d. and 1s., will be charged to the ground. Members will have as usual free admission.

This is Mr. Hamel's first appearance in Birmingham, and those in Birmingham who have not previously seen him will now have the opportunity. The ground is 10 minutes' walk from the Alcester Lane's End Tram Terminus, or can be reached by the Stoney Lane



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Public Safety and Accidents Investigation Committee Meeting.

A MEETING of the Public Safety and Accidents Investigation Committee of the Royal Aero Club was held on Friday, December 20th, 1912, when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. A. E. Berriman, Mr. G. B. Cockburn, Mr. F. K. McClean, Mr. A. Ogilvie, Maj.-Gen. R. M. Ruck, C.B., R.E., Com. C. R. Samson, R.N., Staff-Surgeon H. V. Wells, R.N., and the Secretary.

**Wembley Accident.**—Several eye-witnesses attended before the Committee, and gave evidence on the fatal accident to Lieut. Wilfred Parke, R.N., and Mr. A. Hardwick. Mr. Handley Page also attended, and produced plans of the aircraft, and gave evidence on various points raised by the Committee. The enquiry was adjourned till Wednesday, January 1st, 1913.

## Fatal Accident to Mr. Edward Petre.

The news of the sad accident at Marske-on-Sea on Christmas Eve was received at the Club with great sorrow. The official representative of the Club in Yorkshire, Mr. Frederic Strickland, of Malton, immediately proceeded to the scene of the accident. Before his arrival, however, the wrecked aircraft had been removed by the police from the field where it fell, to a stable, and very little, if any, information could be obtained from an examination of it there. On Friday, December 27th, 1912, Mr. G. B. Cockburn and Mr. H. E. Perrin, the Secretary, joined Mr. Strickland at Marske-on-Sea and examined a number of eye-witnesses of the accident. Their report was submitted to the Accidents Committee at its meeting on Wednesday, the 1st inst.

## Royal Aero Club Certified Trials.

### SPEED TRIALS.—Regulations (Aeroplanes).

1. Certificates of speed will be delivered in respect of flights over a straight course of not less than 1 kilom. Each trial shall consist of four flights out and back in quick succession, and the times will be taken at the moment of passing each mark. The speed of the trial shall be the mean of the speeds of the flights out and back.

2. The competitor shall rise from the ground to the height at which he proposes to cover the measured distance, and shall maintain approximately the same level throughout the trial.

3. All flights must be controlled by one official observer assisted by at least one official timekeeper, both previously approved by the Club, and a mark keeper, approved by the observer, at each mark.

4. The course over which the flight is accomplished must be certified by a surveyor approved by the Club, and checked by the observer, the surveyor's plan being lodged with the Club.

5. Entries must be made upon the entry form provided for the purpose, and must be accompanied by a cheque for £5 5s., the amount of the fee. The entry form, which must be duly filled up as regards the nature of the test and full particulars of the aeroplane, must reach the Secretary at least seven days prior to the trials.

*If desired by the competitor, the carried weight shall be recorded on the certificate. For details, see Regulations 1, 2 and 3, Weight carrying.*

### VERTICAL SPEED TRIALS.—Regulations (Aeroplanes).

1. Certificates for vertical speed, i.e., climbing speed, will be delivered in respect of flights recorded by barograph and controlled by an official observer appointed by the Club.

2. The barograph must be provided by the competitor, and be provisionally approved, set, and sealed by the observer prior to the start.

3. The record sheet of the barograph must travel at least 6 ins. in one hour.

4. The test shall be reckoned to have commenced at the time when the competitor shall have risen 100 feet as registered on the barograph.

5. The certificate will state the time taken to rise 1,000 feet, 2,000 feet, and so on per 1,000 feet above the 100 feet starting level. Failure to attain a height of 1,000 feet above the starting level will be recorded on the certificate.

6. After the descent the competitor shall deliver the barograph to the observer, who shall take charge of it and deliver it sealed to the Royal Aero Club for examination. In the event of the competitor alighting at a distance from the starting point, he shall immediately take steps to inform the observer of his whereabouts.

7. Entries must be made upon the entry form provided for the purpose, and must be accompanied by a cheque for £5 5s., the amount of the fee. The entry form, which must be duly filled up as regards the nature of the test and full particulars of the aeroplane, must reach the Secretary at least seven days prior to the trials.

*If desired by the competitor, the carried weight shall be recorded on the certificate. For details, see Regulations 1, 2 and 3, Weight carrying.*

### HEIGHT TRIALS.—Regulations (Aeroplanes).

1. Certificates of height will be delivered in respect of flights recorded by sealed barograph. The ascent must be performed in the presence of an official observer, who will independently of the barograph record the time of leaving the ground and, if possible, alighting.

2. The barograph must be provided by the competitor, and be provisionally approved, set, and sealed by the observer prior to the start.

3. After the descent the competitor shall deliver the barograph to the observer, who shall take charge of it and deliver it sealed to the Royal Aero Club for examination. In the event of the competitor alighting at a distance from the starting point, he shall immediately take steps to inform the observer of his whereabouts.

4. Entries must be made upon the entry form provided for the purpose, and must be accompanied by a cheque for £5 5s., the amount of the fee. The entry form, which must be duly filled up as regards the nature of the test and full particulars of the aeroplane, must reach the Secretary at least seven days prior to the trials.

*If desired by the competitor, the carried weight shall be recorded on the certificate. For details, see Regulations 1, 2 and 3, Weight carrying.*

### WEIGHT CARRYING TRIALS.—Regulations (Aeroplanes).

1. Certificates for weight or passenger carrying will be delivered in respect of flights where each passenger carried must be at least 18 years of age and not less than 9 stone 6 lbs. in weight.

2. The carried weight shall comprise the weight of the aviator, passengers (if any) and ballast, but shall not include fuel.

3. The weight must be verified by an observer appointed by the Club, immediately before and after the flight, and all weighing must be done on Government tested machines, provided by the competitor and approved by the Royal Aero Club.

4. The attempt shall be for a minimum flight of 15 minutes.

5. Entries must be made upon the entry form provided for the purpose, and must be accompanied by a cheque for £5 5s., the amount of the fee. The entry form, which must be duly filled up as regards the nature of the test and full particulars of the aeroplane, must reach the Secretary at least seven days prior to the trials.

*Should a further certificate be desired for speed with a given weight, vertical speed with a given weight, or height with a given weight, the regulations for the respective tests will be followed, in addition to the above, as far as applicable.*

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

## Regulations Against Flying in Austria.

REGULATIONS have now been issued by the Austrian Government forbidding flying over certain areas, and should pilots accidentally get over such areas they are required to land at once and report the matter to the Authorities. All aviators, on landing, must report themselves at once to the police. The carrying of arms, explosives or carrier pigeons is forbidden, while photographic apparatus can only be carried if a permit has been obtained from the Authorities. It is stated that offenders against these regulations will be prosecuted, and if they do not land when signalled to, will run the risk of "immediate military measures being taken against them."

## A Fire at Issy.

FORTUNATELY the presence of mind of the night watchman at the Astra Co.'s ground at Issy prevented the fire there, on the 19th ult., becoming so serious as it at first threatened to do. Apparently the envelope of the Astra-Torres airship caught alight, and this set fire to the envelope of the "Lieutenant Chauré." The Torres envelope was destroyed and the other one seriously damaged before the fire was got under control, but the cars of these airships, as well as those of two others which were in the shed, were only slightly damaged. M. Henri Deutsche's Blériot limousine as well as his big Voisin hydro-aeroplane were also in the shed and had their wings scorched.

## EDDIES.

OUR first issue of the new year—and in what better way can I commence on my notes than by wishing all our readers the very best of luck and prosperity during the coming twelve months. For nearly four years now, and for many more in some cases, a lot of us have been working, and working hard too, each doing his own share, according to individual ability, to further the cause of the newest of sciences and newest of industries. That enthusiasm which gripped us in the early days, and attracted us towards aviation, has tided us along till now, and undoubtedly it will maintain us on the march forward. But I venture to suggest that, for those commercially minded at least, something more than enthusiasm must be forthcoming, and that right soon, if the progress is to be kept up.

Up to the present time, in England, aviation has been starved, and looking back it is quite surprising we have made the progress we have. In France a different condition of things has obtained. There they have financiers who appeal to me as considerably more sporting, and whose minds think farther ahead than our monied men here. They have a Government that has, from the first, recognised the importance of the new arm and that has laid out no mean portion of the nation's income to help forward its progress. And besides, they have been lucky and still are lucky in possessing men of wealth who, being exceptionally keen on aviation, have willingly given of their wealth to help matters along.

And, thus far, many of the keen workers have been struggling along in a half starved condition. The Government knows the remedy, but unfortunately for us they do not seem inclined to move very rapidly or encouragingly in the matter. Everyone recognises that they will want machines in large numbers one of these days. It is quite within the realms of possibility they may want a large number, and, perhaps, sooner than they anticipate, at very short notice. In that case, it is fairly certain they will not be able to get them from the English industry. Financial assistance is required now, otherwise we shall see many firms that have been bravely struggling along, doing all the time most commendable work, dropping out of the arena of aeroplane construction simply through lack of the wherewithal to continue.

Commencing this new year of nineteen-thirteen, we, as a matter of course, one to another express our wishes for a prosperous new year. It is wanted badly enough in all conscience in aeronautical circles. We would like the Government to give the worthy workers in the aviation world a very prosperous year, but, in face of their slowness to move, perhaps this is a little too much to expect. We will modify that wish. Let an *encouraging* year be given them, and we shall then be in a much happier frame of mind than we are now.

Congratulations to Mr. Howard Flanders on the excellent results that have attended the tests, carried out by his pilot, Mr. Raynham, through which his biplane has been put during the last week or two at Brooklands. Taking my mind back a few months, I well remember seeing, in course of construction, a very business-like biplane at the Flanders works at Richmond. I saw that



We publish above a reproduction of the FLIGHT Certificate of Merit sent in to our Model Section contributions of an exceptionally n... The above very striking design is the work of Mr. J. Procházka on cards. It must be clearly understood, of course, that these certificates are not in any sense related to competitive events with model aircraft. Liverpool, for his notes on "Paper Glider Experiments." (Part I) accompanying sketches in their original form, as an example of what we have to be





# FLIGHT

## CERTIFICATE of MERIT

awarded to

*G. H. Kilshaw*  
for  
his contribution entitled  
*Notes on Paper  
Glider Experiments*

*Stanley Spooner*  
Editor

which, as we announced some time ago, we intend to award to those who show character. Each certificate is accompanied by a small money prize of 5s. The first certificate has been awarded to Mr. G. H. Kilshaw, of (see page 23). We purposely publish the contribution unedited, with its standard that we desire to encourage. Ordinarily all sketches that are sent for publication purposes.

machine later at Lark Hill, for it had been designed to comply with the conditions of the Military Aeroplane Competition there, but it was not able to take part in the tests for the reason that the engine for which the biplane had been designed was not ready for use. Terrible bad luck that, for the machine was universally acknowledged to be one of the most promising of all the various types of aeroplanes gathered there. Since then I have seen that same machine lying forlorn, and still engineless, in the Flanders shed at Brooklands.

After he had got over the brunt of work in connection with the delivery to the War Office of the four monoplanes they ordered from his company, Mr. Flanders has had some time of late to attend to his biplane. A fortnight ago to-day he obtained delivery of an engine for it, a 40-h.p. A.B.C., and by the next day, Sunday, the machine was ready to go out on its tests. Mr. Raynham flew it successfully at the first time of asking, and later on he actually carried two passengers besides himself. The flying speed of the machine was about 50 miles an hour, and considering that the machine itself was by no means a light one, and that it had been originally designed to fly at 85 miles an hour with an engine of 120-h.p., its performance can be considered as most noteworthy. Unfortunately last Sunday the machine got somewhat disintegrated through Raynham trying conclusions with an iron fence. Encountering a rather bad eddy, his engine at the same time suddenly took it into its head to switch itself off, and he had to make a hurried landing, which, had it not been for the iron railings, would have been successful.

But as Raynham himself was not hurt a bit, and as the damage to the machine was for the most part confined to the planes, no great amount of harm was done, for Mr. Flanders had intended to fit new planes of a much greater camber, to suit the lower horse-power of the engine in use at the present time.

While drawing attention to this excellent performance, we must not forget that the British-built engine—a 40-h.p. A.B.C.—that enabled it to be accomplished has to be given its share of the credit.

The next week or two should see the arrival of a new Blackburn monoplane at Hendon. It will be an all-steel machine and fitted with a 100-h.p. Anzani motor. Lieut. Spencer Grey, I have heard, will fly this machine through its preliminary tests.

From Frank Champion, an early Hendon pupil of the Blériot school, who returned to America to fly there, I have had another of his unusually interesting letters. He is, he explains, "laying off" for a while previous to going on the road again with his monoplane early in February, when he will start a tour in Texas. He has just finished a season with the Moisant Co., and, taking it all through, he finds he hasn't a great deal to grumble at, for he has made about 127 flights without even so much as breaking a wire, although he had to fly from some grounds which varied in size, as he puts it, from a postage stamp upwards.

He has a story to tell. Wandering around outside a ground at Helena, Arkansas, where he was due to make

an exhibition, a man who was evidently turning over in his mind whether or not he would pay to go inside, went up to him and said, "Waal, if yer airship don't go no higher than the fence, it won't be worth four bits, an' if it does, I can see it fer nothin'."

Following on four years of sheer hard work in aviation, Mr. Claude Grahame-White is taking, with Mrs. Grahame-White, a month's respite from his labours, at St. Moritz. He certainly deserves it too, for from the date he determined to negotiate with Blériot for the purchase of his first machine—the two-seater side-by-side under-slung "White Eagle," with a 60-h.p. E.N.V. engine—he seems never to have rested a moment from putting the whole of his remarkable energy in the work he had decided to take up. For some little while past he has not been enjoying his usual good health. Let me express the hope that he will come back from his holiday thoroughly fit and well, and ready, if need be, to start another four years of strenuous exertion.

Henri Salmét, as well, is having a good long rest after the hard work he did during the past season in flying 5,000 miles in all sorts of weather on behalf of the *Daily Mail*. He tells me that he hopes to start flying again in the early spring. It is not generally known that, last year, flying from town to town on his tour, he made repeated appeals to the crowds that watched him, on behalf of the local hospitals. By his thoughtfulness in this respect he was able to hand over to the various charities no less a sum than £180. In his flights this year it is his intention to double, and possibly treble, that amount.

Paulhan has been flying again. Last Sunday afternoon, on the Seine, at Bezons, he was carrying out tests on a new Curtiss flying boat of which he had just received delivery from Hammondsport, U.S.A. The machine was just unpacked, erected, run down the slipway into the river, the engine started and away he flew without

any delay for adjustment of any kind. Fitted with an 80-h.p. water-cooled Curtiss motor, the machine showed its ability to maintain a speed of over 60 miles an hour, with a pilot and passenger on board. The machine by itself, with petrol and oil aboard, weighs less than 1,150 lbs.

As an expression of their appreciation towards Mr. Corbett-Wilson, the Irish aviator, the people of the City and County of Kilkenny have presented him with a valuable memento of his flights in that district in the form of a neatly made silver model of the Blériot machine on which his flights have been carried out.

It will be readily understood that it is almost an impossibility to compile a retrospect of any year's progress without, unintentionally, missing or overlooking one or two events of importance. In the retrospect that we published in our last issue, a friend of mine has pointed out, we omitted to mention, in connection with the flights from England to Ireland, the excellent flight Mr. Vivian Hewitt made in crossing from Holyhead to Dublin. We hope Mr. Hewitt will excuse the omission. By the way, in a letter we had from him a week or so since, we learned that the machine on which he has done most of his flying up to the present has been thoroughly overhauled; new wings are being fitted, and it is generally being got ready for another season's hard work.

On behalf of the Editor and Editorial staff of *FLIGHT*, it is my pleasant duty to heartily thank all those many kind friends who sent to us the Season's Greetings and their best wishes for the continued success of the paper. Before me as I write there is a whole stack of them—from all parts of Great Britain, four others are dated from Australia, ten from the States, seven from Belgium—they come from all parts of the world. It would be impossible for us to reply to them individually. It is indeed very gratifying when it comes home to us in this way that so much interest is taken in our work.

"OISEAU BLEU."

## AERONAUTICS AT SOUTH KENSINGTON.

By way of whetting the appetite for the Aero Show at Olympia, which is due to open on February 14th, the temporary collection of Aeronautic Exhibits which is on view during the present month, at the Science Museum, South Kensington, should serve a useful purpose. Although, to the casual visitor, the exhibition may not seem a very extensive one, the authorities have, by careful discrimination, and with the assistance of the Royal Aero Club, the Aeronautical Society of Great Britain, the Royal Aircraft Factory, the National Physical Laboratory and the Meteorological Office, got together a most interesting collection, illustrating the history of aeronautics as well as the research side of the science, while the visitor who is not content unless he "can see the wheels go round," will also not go away disappointed.

Just before entering the gallery, one notices one of the large Cody kites and also the basket of a balloon. Suspended along the roof of the gallery are the Pilcher and Lilienthal gliders, a Chanute type of glider, a model of Sir Hiram Maxim's first machine, and the model made by Henson and Stringfellow in 1844. Perhaps the exhibit which will interest most visitors is Mr. Ogilvie's Baby Wright machine, mounted so that the various controls can be studied, while a full-sized Birdling monoplane has been lent

by Mr. F. K. McClean. There are also models of the Santos Dumont, Blériot, H. Farman, Wright, and Short machines. Aeroplane engines are well represented in the 50-h.p. N.E.C. two-stroke engine from the Baby Wright machine, the 30-40-h.p. Green engine, shown in the Spencer airship frame in the lower gallery, the 60-h.p. Green engine, which won the Alexander prize in 1911, a 50-h.p. Gnome complete, and a similar motor taken to pieces, and the Antoinette motor which did duty in "Nulli Secundus." Dirigibles are represented by large models of the British Army and other airships, and one of the Short gas-valves from the ill-fated Naval airship. There is a working model of the wind-tunnel at the National Physical Laboratory, and photographs and diagrams of results of experiments made with it and other appliances at the N.P.L. Samples of the fabrics and materials tested there are also on view. There is a good collection of instruments of various kinds, and one end of the room has been fitted up as a Meteorological station, where anemometers, wind recorders, &c., are seen in working order.

Apart from the actual models, &c., there is a large assortment of photographs and diagrams illustrating various subjects, all of which will well repay study.

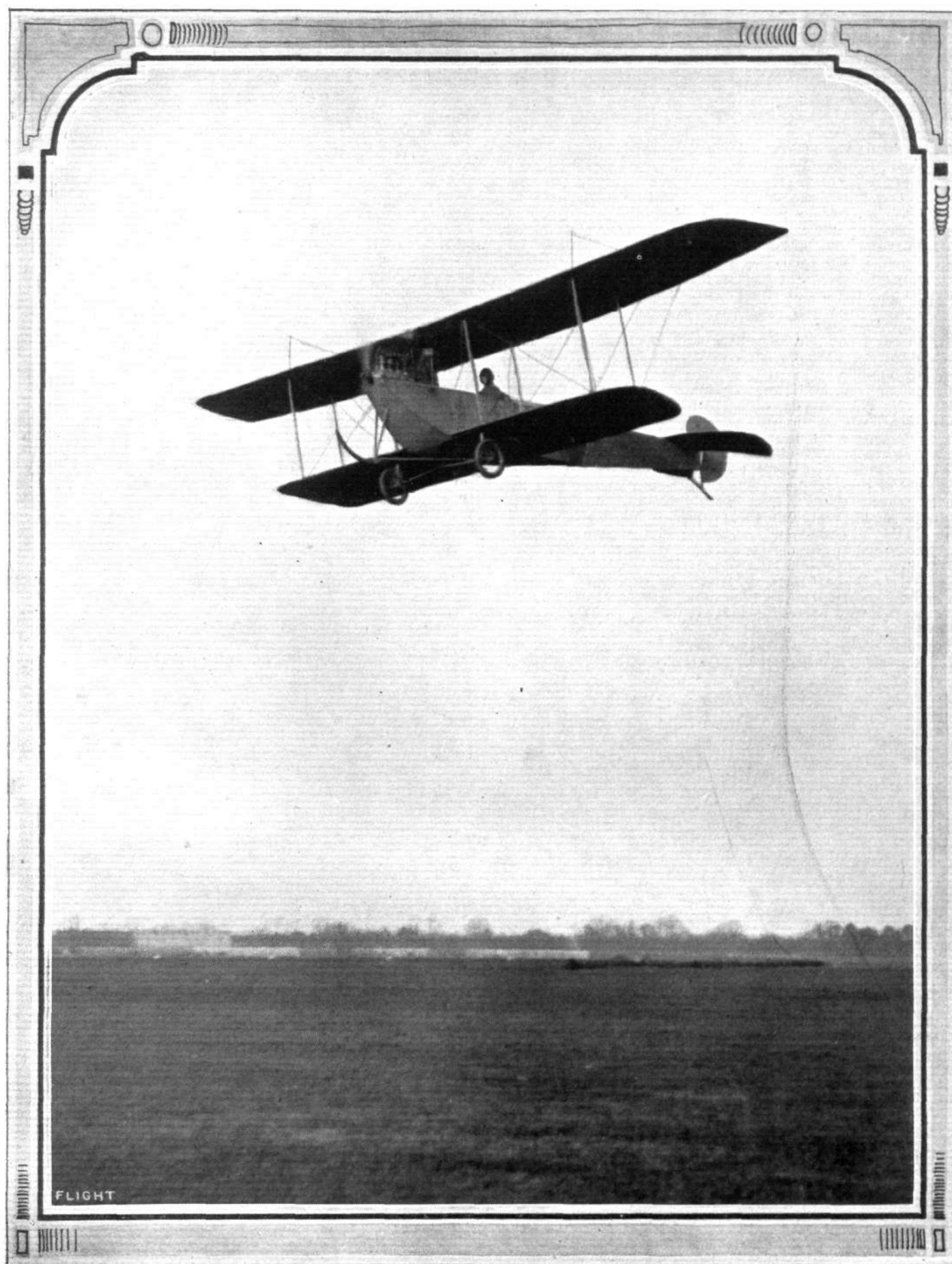
## The Navy's First Air Station Established.

WITH the official announcement of its *personnel*, which appears elsewhere in this issue, the Isle of Grain Air Station, situated at the mouth of the River Thames, has come into official existence as the first of the chain of aviation centres which the Admiralty propose to establish along the East Coast.

## British Airship Officer Takes His Ticket in France.

ON December 20th, at the Maurice Farman School at Etampes, Commander E. A. Masterman, R.N., officer commanding the Naval Airship Section of the Royal Flying Corps, successfully passed the necessary tests for obtaining his pilot aviator's certificate. His practice was about the shortest on record.





Mr. F. P. Raynham flying the Flanders biplane at Brooklands.



## FROM THE BRITISH FLYING GROUNDS.

### Brooklands Aerodrome.

ON December 21st., Mr. Merriam went up on the Bristol biplane in the afternoon, and on coming down reported that the conditions were not suitable for holding the altitude competition, which was consequently abandoned. In the morning, before breakfast, the weather conditions were ideal for flying, and Lieut. Empson and Lieut. Ewing, R.N., both qualified for their *brevets* in good style on Bristol biplanes.

Next day there was a fair attendance of spectators for the Quick Starting and Alighting Competition. Each pilot was allowed the services of an assistant to give the propeller a turn, and the time was taken from the moment of the machine leaving the ground, and one lap was flown round a pylon, the competitors then landing as near the mark as possible. The result was another fine performance by Mr. Merriam, on a Bristol biplane, who took 11½ secs. to rise from the ground, landing dead on the mark. A good performance was accomplished by Mr. Pashley, on a Sommer biplane, who took 15 secs. to rise, and landed within 29 ft. of the mark. Mr. Bendall, on a Bristol biplane, was third, and Mr. Alcock, on a Ducrocq-Farman biplane, fourth.

Mr. Flanders and Mr. Raynham were out testing the new Flanders biplane, which promises to be a very speedy machine when fully tuned up.

Friday, last week, Mr. Humphrey was out on a Percival-Caudron biplane. No flying next day owing to rough weather conditions. Sunday, Mr. Raynham was out testing the new Flanders biplane. In the afternoon a few spectators put in an appearance, but no competition was held, the weather conditions being unsuitable, and most of the pilots being away on holidays.

In view of the big programme on Sunday, January 5th, no definite competitions have been fixed for January 4th, but if the weather is suitable, the aviators and pupils will be out practising as usual. On Sunday next the entries for the special competition are:—Mr. Merriam and Mr. Bendall (Bristol), Mr. Barnwell (Vickers), Mr. Knight (Vickers-Farman), Mr. Spencer (Spencer), Mr. Pashley (Sommer), Mr. Alcock (Ducrocq-Farman), Mr. Percival (Caudron), Mr. Sopwith and Mr. Hawker (Sopwith). Should the weather be at all decent, a very interesting afternoon should be spent by all those visiting the Weybridge track.

**Bristol School.**—Jullerot out for couple of tests on Monday last week, but weather too bad for school work. On Tuesday, Jullerot

was up for a trial but decided not to attempt further trips owing to the strong wind.

Although Jullerot ascended on Friday for a couple of tests nothing more was possible owing to the extremely unfavourable conditions.

On Sunday, Harrison was out quite early flying a couple of circuits, then giving numerous trips to Lieuts. Bowhill and Vernon. Wind increased and prevented continuation of the school work.

**Ducrocq School.**—On December 21st Jack Alcock out in the morning with Mac Andrew as passenger, circling Byfleet, Weybridge and Walton; also, making banked turns and figures of eight over Brooklands with passengers. Mac Andrew got in some figures of eight in the morning, landing on the mark in fine style. In the afternoon, Jack Alcock flying in strong wind solo, and with new pupil as passenger. Next day was windy, but Jack Alcock was out for usual cross-country flight in morning, and again in afternoon over aerodrome. Stoppage of petrol pipe prevented him finishing in the competition.

No flying on Monday, Tuesday, Wednesday and Thursday, on account of wind and rain. Maurice Ducrocq out on Friday, last week, at 1.30, in very gusty wind. Tested new altimeter, several circuits, but rain and higher wind soon prevented flying.

No more work could be done on Saturday, Sunday, Monday and Tuesday, on account of the wind.

**Howard-Flanders School.**—On December 22nd the biplane, which was unfortunately withdrawn from Military Trials in August, out for first time, now fitted with 45-h.p. A.B.C. engine. Raynham took machine for straights. She got off easily and showed quite satisfactory lift. Then took Mr. Flanders for passenger flight, in which she showed equally well. Afterwards a few straights solo. On the next day, Monday, at Farnborough, Raynham put monoplane F 4 No. 3 through rolling and climbing test. Machine inspected by the authorities of the R.A.F.

Raynham out on biplane at daybreak, Tuesday. After a few straights and solo circuits, he took Mr. Dukinfield-Jones up, and afterwards in addition, in order to test lift, took Mr. Layzell-Apps. The machine lifted with 3 up quite easily and reached height of about 60 ft. in the straight, (with 45-h.p. on machine designed for 100-h.p.). Later Raynham circuits solo.

Raynham solo on biplane early Sunday. Wind rather high, so only did straights. Out again about noon doing straights. After half a dozen straights, had to make forced landing owing to magneto cutting out when he was low down over river. Tried to land between river and finishing straight, but could not get round in time. Right wing and wheel caught on iron fence, and machine turned a somersault. Raynham, wearing helmet and belt, was unscratched, whilst only slight damage to machine resulted, including broken propeller and planes.

### Eastbourne Aerodrome.

DURING the past few weeks the weather has been the chief topic of conversation amongst the flying fraternity at the aerodrome, many very uncomplimentary remarks have been made about it and a great deal of bad language used, but without the slightest effect. On several occasions considerable anxiety was felt for the safety of the hangars, the force of the wind being so terrific; however, they still stand, so all is well.

Friday, Saturday and Sunday before Christmas were the only really fine days experienced for three weeks, and Lieut. Laniger, an old pupil who has been away for some time, was the only one who got in any practice. During the three days he made splendid progress, and by Sunday was quite ready to go for his ticket; unfortunately the weather was not good enough in the afternoon. Messrs. Roberts, Cookson, Thompson, Thornely and Lieuts. Brown and Minchin have all been away on their holidays, so Mr. Hammond has had very little tuition work, he has, however, done a good bit of passenger carrying and made one particularly good flight on Monday last in quite a strong breeze. Passing right along the front, over the sea, he made several circles round the pier head and then returned to the aerodrome. The new monoplane which the Company are building and which has been designed by Mr. Emile Gassler, is nearing completion, and the machine should be ready for a trial in about a fortnight's time. The War Office have rented one of the Company's hangars and it is hoped that some of the officers of the Royal Flying Corps will shortly pay a visit to the aerodrome.

### London Aerodrome, Collindale Avenue, Hendon.

**Aircraft Co. School.**—Verrier started off for Eastchurch on a Maurice Farman at 11 a.m. on December 20th, carrying a passenger, but owing to the mist and smoke had to return to the aerodrome. Later he got away again, but experienced the same difficulty.

On Saturday, Verrier was carrying passengers and flying in his usual brilliant style, and on Sunday he was out testing a new



Mr. W. Featherstone, who took his Royal Aero Club *brevet* in excellent style at Brooklands at the Bristol School during the week preceding Christmas.

Maurice Farman destined for the Naval Wing, the machine flying splendidly.

Monday, last week, Pierre Verrier, accompanied by Lieut. Mapplebeck as passenger, left the aerodrome at 12.40 for Farnborough, arriving there at 2.10, he having all the way to fight against a strong wind.

Next day Verrier was out piloting a Maurice Farman machine at 12.30 although the wind was showing on the aerodrome anemometer 35 miles an hour.

**Blackburn School.**—Saturday morning a trial flight was made by Mr. H. Blackburn, when they sent Mr. Buss to commence doing circuits, who after about four circuits landed in good style, and Mr. Glew followed with four circuits. An hour later Messrs. Buss and Glew both flew round the aerodrome for 12 mins., each feeling quite at home on the machine. This is a very creditable performance since it is their first departure from straight flights. Following this Mr. Morris spent 20 mins. practising rudder work on the ground.

On Christmas Day, Dr. Christie, at 8 to 9.30 a.m., practising straights and landings on his own machine, finishing off with a circuit of the aerodrome, after which the wind came and the machine was put away; and on Friday, last week, Dr. Christie was out early with his own machine, practising straights and curves for half an hour or so, after which he commenced a circuit, but taking so wide a curve that he could not get round he landed very hurriedly, breaking some of the woodwork.

Dr. Christie has made great progress in flying with his rare opportunities, and handles his machine in a very capable manner.

**Dep'rdustin School.**—Sunday, last week, Lieut. Porte took out his 100-h.p. Anzani machine for a flight with a passenger, and when over a clump of trees adjoining the aerodrome the engine gave out suddenly and the machine began to drop, but by an excellent bit of handling he just managed to clear the obstruction and alight safely within the aerodrome. Subsequent examination of the engine, which was practically ruined, showed that a hardened steel nut had been put into one of the cylinders. This affair following on one or two suspicious incidents led to the belief that the machine had been deliberately tampered with, and the occurrences, which are referred to elsewhere, have been reported to the Royal Aero Club.

From Monday until Thursday the weather behaved abominably, absolutely prohibiting school work of any kind.

Friday morning. Weather was calm but misty. Mr. Brereton took out *brevet* machine No. 3 for a test flight, and finding conditions were favourable handed machine over to Mr. Valazzi, who put in some very good straight flights. Mr. Scott also out on the same machine, doing straights in good style. Mr. Andrews, having returned after a long absence from the school, had a few turns on Taxi No. 2 machine, which he handled very well.

Saturday was a blank day for pupils, the weather becoming very boisterous. On Monday last, Mr. Brock was out early testing No. 4 *brevet* machine, doing several circuits. Mr. Valazzi and Mr. Scott also put in some very useful work on No. 2 machine. Mr. Phelps was also practising on the same machine, showing some improvement.

**W. H. Ewen School.**—With the Christmas festivities the



### Father Christmas Parachuting.

RECOGNISING that flying over London was contrary to the Royal Aero Club regulations, and yet wishing to get a view of London from above, Capt. Penfold, the Australian aeronaut, decided to make a trip across the metropolis in a balloon. To give a practical side to the trip he arranged with the Sandow Chocolate Co. to disguise himself as Father Christmas and descend at the first suitable point by parachute and distribute samples of Sandow's chocolate on landing. Through Messrs. Aeros, Ltd., he secured the use of one of Messrs. Spencer Brothers' balloons of 45,000 cubic feet capacity, which, piloted by Mr. Henry Spencer, and carrying a cinematograph operator, left the gasworks at Battersea at 12.45 p.m. on 23rd ult.

Capt. Penfold was seated on the edge of the basket holding the cords of the parachute, which was fastened to the net of the balloon. A 25-mile wind was blowing, necessitating a good deal of manoeuvring before the word to "let go" was given, and after just clearing the gasometer they crossed the Thames at a height of 1,000 ft. At about 1,200 ft. up the only recognisable object was the spire of Westminster Cathedral. The balloon travelled at a height of some 4,000 ft. above the clouds for a long way, and then dropping down through the clouds, the aeronauts found clear country near Chelmsford. At 3,000 ft. Capt. Penfold slid off the basket. He dropped about 500 feet before the parachute opened and the wind swayed him about terrifically. While descending he travelled safely for a distance of about three miles across country and landed safely at Little Baddow, where he distributed the chocolate.

regular routine of school work has been upset, with most of the pupils off holidaying. The few enthusiasts who remained to take advantage of any favourable weather were able to get in some nice practice. On Saturday, December 21st, pupils commenced an excellent day's practice under the instruction of Mr. L. W. F. Turner and M. Baumann. Mr. Turner had out the 35-h.p. Caudron, and after a test flight handed the machine over to Mr. L. Russell who made several circuits of the aerodrome, handling the machine in a confident manner, finishing with a *vol plané* from 60 feet. Mr. Warren also made several good straight flights on the same machine, making good landings.

The pupils, under the instruction of M. Baumann, were also making excellent progress, Lieut. M. W. Noel making good straight flights at 30 ft., on the 28-h.p. Caudron, while Messrs. R. S. McGregor, E. T. Prosser, and M. Zubiaga, were all showing good results in straights, on monoplane No. 1. M. Baumann also put up a splendid exhibition flight on the 35 Caudron, flying several circuits and finishing with a *vol plané* from 300 ft. During the afternoon, Mr. Turner gave a fine exhibition on the 60-h.p. Caudron, in a rising wind, finishing with a spiral *vol plané* from 1,500 ft.

On Sunday the 22nd the wind was too high for pupils' outdoor practice, Mr. Turner, however, made a good exhibition flight on the 60-h.p. Caudron.

On Friday the 27th, Lieut. Bayly made several excellent straight flights on the 28-h.p. Caudron under the instruction of M. Baumann.

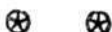
**Jameson and Temple School.**—Mr. Temple was out on Blériot No. 2 for 16 mins. on Friday morning. On Monday Mr. Temple was out testing the 45-h.p. Anzani-engined Blériot, which has been built in the School, and will be used for *brevet* tests, but as the engine was not pulling well, further adjustments were necessary. In the afternoon, Mr. Temple again brought the 45-h.p. machine out for 63 mins., appearing to have perfect control.

### Salisbury Plain.

**Royal Flying Corps.**—As nearly all the officers and men of the Royal Flying Corps have been enjoying a short period of leave, there is not a great deal to record. On Saturday week, Capt. Dawes took Lieut. Wadham over to Farnborough on the Maurice Farman, 214, and while he came back on the same machine Lieut. Wadham brought over Maurice Farman, 216. Air mechanic McCudden afterwards made a trial of half an hour on 214.

### South Farnborough.

**Royal Flying Corps.**—Last week the men of the various squadrons were on Christmas leave and there was no flying. The weather during the Christmas holidays was, as elsewhere, anything but ideal, high winds and heavy rainstorms prevailing. The men returned from leave on Monday, and on Tuesday, although the weather was stormy, Major Raleigh, the officer commanding No. 4 Squadron made a splendid flight in the morning on the 100-h.p. Breguet 210. The wind was south-westerly and blowing in heavy gusts, from 30 to 40 miles per hour, and the flight was a splendid instance of what can be done on a high-powered machine, when in the hands of a skilful pilot.



Capt. Penfold weighed 145 lbs., the parachute 25 lbs., while it carried 30 lbs. of chocolates. When relieved of this load the balloon shot up to 10,000 feet and eventually landed near Hatfield Peveril. On May 14th, 1908, Capt. Penfold twice passed over San Francisco, the second trip being at night, when the aeronaut "bombed" the fleet.

### Aerial League Dance at Southampton.

AT the Shirley Assembly Rooms, Southampton, on Tuesday, December 17th, the first of a series of dances organised by Mr. Mortimer Griffin, of Southampton, in aid of the National Aviation Fund of the Aerial League, took place. There were between 70 and 80 people present, and the dance was a great success. The next Southampton dance in aid of the fund will take place on Thursday, January 16th, 1913.

### Santa Claus at Brooklands To-morrow.

A SPLENDID programme has been arranged for the meeting which is to be held at Brooklands to-morrow, Sunday, and in addition to the prizes which are being offered for the speed, quick starting, bomb-dropping, and alighting competition, other prizes will be given for the best all-round performances. With the assistance of Mr. Merriam, the manager of the Bristol Co.'s School at Brooklands, the B.A.R.C. has arranged for a visit from Santa Claus, who will arrive "by the aerial way" about 3 p.m. Santa Claus will distribute gifts from his aeroplane to every child under fourteen years of age in exchange for a ticket obtained from the gatekeeper on entering the aerodrome.



# FOREIGN AVIATION NEWS.

## New World's Speed Records.

ON a Morane-Saulnier monoplane fitted with one of the 50-h.p. Rhone rotary motors, Gilbert at Etampes on Monday succeeded in bettering the speed records from 350 kiloms. to 500 kiloms., which have stood since they were made by the late Pierre Marie two years ago, and the 600 kiloms. record of Fourny. The course was exactly 10 kiloms. round, and he beat the 350 kilom. record by nearly an hour, as can be seen from the following table:—

New record.				Old record.			
		h.	m.	s.	h.	m.	s.
350 kiloms.	...	3	26	16	4	17	26
400 "	...	3	55	27	4	54	6½
450 "	...	4	24	44	5	30	35½
500 "	...	4	54	6	6	7	7½
600 "	...	5	52	38	8	7	0

The speed worked out to 102 k.p.h. For the 600 kiloms. the fuel consumption was 110 litres, while 12 litres of oil were used.

## Flying Across the Adriatic.

A FINE overseas flight was made by Geo. Chemet on a Borel hydro-aeroplane on the 21st ult., when, accompanied by Commander Ginnocchio, he started up from Venice and flew over to Trieste. After circling above the city he made a brief landing, and then immediately started on the return journey. He had only covered 40 kiloms., however, when a sparking-plug gave out, necessitating a descent on the water. The plug was changed by the passenger and the journey resumed, the machine showing a speed of about 120 k.p.h. for the latter part of the trip. The journey across the Adriatic, from Venice to Trieste, a distance of 128 kiloms., was twice made in September, 1911, by Witmer on a Blériot, but Chemet is the first to make the double journey. The Borel machine used is the first of eight hydro-aeroplanes of this type which have been ordered by the Italian Naval authorities.

## Garros' Flight to Rome.

BRIEF mention was made in our last issue of the successful termination of Garros' trip from Tunis to Rome, and a few further particulars are now available. Having made the journey from Tunis to Trapani on December 18th he was delayed by slight repairs to his machine until the 21st, when at 7.50 a.m., he got away in a bee-line for Palermo, which was passed after 50 minutes' flying. Continuing straight ahead in the direction of Messina he made a stop at Cannarella in the north-east corner of Sicily, where nearly four hours were spent. Getting away again at 3.20 p.m. he passed over Messina and then steering across to the Italian coast, followed it to St. Eufemia, where he landed at 5.15 and decided to stay for the night. He was away the next morning at 8.50, and reaching Naples at 11.3, stopped for lunch and rested until 1.20 p.m., when he once more got away for Rome where a safe landing was made at 2.53 in the Piazza d'Armi. The total distance covered was 1,158 kiloms., the three stages being Tunis to Trapani 320 kiloms., Trapani to St. Eufemia 400 kiloms. and St. Eufemia to Rome 438 kiloms. On the following day he was entertained to dinner by the Italian Aero Club and a great reception was accorded him on his return to Paris by the Aero Club of France.

## A Collision at Villacoublay.

THE extraordinary accident which occurred at Villacoublay on the 21st ult., in which the son of the French Naval Minister was so severely injured, once more emphasises the need for aerodrome managers to see that the rule of the air is adhered to. A biplane piloted by Collardeau, and carrying M. Jacques Delcasse, was run into by a monoplane piloted by the Siamese officer, Nai Thip. Both machines fell to the ground from a height of 90 ft., and were, of course, smashed, but Collardeau escaped with nothing worse than a shaking, while the Siamese was not in much worse case. M. Delcasse, however, sustained fractures of the right arm and left collarbone, while his right knee was smashed, and there were other serious injuries. The latest report, however, is that he is making good progress.

## Vedrine has a Stop.

HAVING an engagement to lecture at Boulogne on Monday evening, Vedrine started to fly there from Rheims on his Deperdussin monoplane. He got as far as Amiens, where he had to land owing to his petrol tank leaking. He placed his machine in one of the military sheds and completed his journey by train.

## Farman Brothers Flying in Company.

ON Monday Maurice Farman on a biplane, accompanied by Senouque and Henry Farman with a lady passenger, flew from Buc to Chartres, where they had lunch. They returned in the afternoon, making a long detour over the country on the way.

## Night Flying Over Paris

ABOUT five o'clock on Monday evening Parisians were rather surprised to see an array of lights moving in the air accompanied by the unmistakable noise of the Gnome engine. It subsequently turned out to be Chemet on the Borel, who starting up from Issy piloted his machine over the Place de la Concorde.

## A New Passenger Record.

ON a Belgian-built Henry Farman biplane with 80-h p. Gnome motor, on the 24th ult. Verschaeve, at the St. Job aerodrome, beat the duration record for a pilot and four passengers. Accompanied by four Belgian officers, he flew for 37 mins. 6 secs., beating Schimeester's record of 33 mins. 59 secs.

## Madagascar Gives Two Machines.

TWO Farman biplanes have been presented to the French Army by Madagascar. The first was tested by Henry Farman on the 23rd ult. and the other, a Maurice Farman, was passed on Saturday, when with Fourny at the helm and a passenger, a load of 250 kilogs. was carried, and it was flying for over an hour.

## From Rheims to the Frontier.

STARTING from the Betheny ground, on the 24th ult., Janoir, on his Clerget-engined Deperdussin, flew over Laon at a height of 1,500 metres, and then making his way through the clouds to Maubeuge, he passed along the frontier and eventually landed at Blombay, near Charleville.

## More Aviators for French Army.

ON the 16th inst., 89 officers, non-commissioned officers and men, who have been undergoing a course of theory at Versailles, will be sent to the various schools, in order to be instructed in practical work and become qualified as aeroplane pilots.

## A New Caudron Machine.

RENE CAUDRON, at Crotoy, on the 24th ult., was testing a new 50-h.p. machine, which climbed 1,000 metres in 10 mins., and attained a speed of 107 k.p.h.

## Cross-Country on Caudrons.

ACCOMPANIED by Sergt. Coquelin, Lieut. Gerard on the 24th ult. flew from Crotoy to Amiens. There they changed places, and went on to St. Cyr, while Sapper Jacquemart went, also on a Caudron, from St. Cyr to Crotoy.

## Fast Trials on a Nieuport.

TIMED by an official timekeeper, Helen, on a new single-seater 80-h.p. Nieuport, on the 24th ult., was timed to attain a speed of 163 k.p.h. over a closed circuit.

## Fast Buc-Rheims Trip.

ACCOMPANIED by Bellot on a R.E.P. monoplane, Amerigo, on the 20th ult., flew from Buc to Rheims in 1 hr. 20 mins. He afterwards went on to Chalons Camp, where he took several passengers for trips on the machine.

## More Deperdussins for French Army.

JANOIR, on the 21st ult., completed the official delivery tests of a batch of eight Deperdussin monoplanes for the French Army, and afterwards made a trial flight of an hour's duration, including a climb of 1,800 metres in 9 mins., on a Deperdussin with a Clerget engine. All these machines were fitted with Rapid Propellers.

## Vedrine to Beat his own Speed Records.

IN the Deperdussin works there is rapidly nearing completion a new monoplane, on which Vedrine hopes to beat his own speed records. The motor is a 160-h.p. Gnome.

## Flying to the Hunt.

HAVING an invitation to join a hunt at Baron E. de Rothschild's castle at Ferrieres on the 23rd ult., Comte de Lareinty-Tholozan decided to fly over on his Blériot from Buc. He left about 10.30 a.m. and was back at 5 o'clock, having covered 150 kiloms. without any incident.

## A Long Flight on Blériot.

BARON Pasquier who has been doing some fine flying at the Blériot school at Buc, on the 23rd ult., flew from Buc to Etampes, Chartres, &c., covering about 250 kiloms. in his morning excursion.

## Testing the Sommer Stabiliser.

BY way of testing the new stabiliser, Bathiat took one of the Sommer machines so fitted, from Mourmelon to Mouzon by way of Rethel, Mezieres, Sedan and Douzy on the 23rd ult., covering the distance of 18c kiloms. in an hour and a half. He stated that the apparatus worked well.

## At the Hanriot School.

PAULET and Favre, each on a Hanriot monoplane fitted with 45-h.p. Anzani engine, made trials of an hour's duration at Rheims on the 24th ult., the former flying at 200 metres and the latter at 1,500 metres. In the afternoon they went over to Mourmelon-le-Grand.



### At the Nieuport School.

FROM the Nieuport ground at Villacoublay on the 24th ult., Naval Lieut. Delevoye and Sergeant Saint Andre were flying over Buc and the Chevreuse Valley for over an hour, Sergeant Hurtard also made the first test for a military *brevet*.

### Aeroplane for Carrying Supplies.

AT Buc, on Saturday, Maurice Farman was testing a biplane specially built for the Italian Government for the transport of food or ammunition. With Capt. Macdonald and a load of 400 kilogs. the machine rose and flew very easily.

### At the Borel School.

ON the 23rd ult. at Buc, Lieuts. Vergnette and Garnier and Sapper Benoist, each made flights of one hour on Borel machines, and Lieut. Personne flew over to Chartres and Orleans.

### Simon a Superior Pilot.

FLYING over a course from Havre to Paris-Plage and back at an average height of 1,500 metres, Simon on his Sommer monoplane made the last test for his superior certificate on the 20th ult.

### A Veteran Motor.

IT is worthy of note that the 50-h.p. Gnome motor on the Morane monoplane on which Garros flew from Tunis to Italy was numbered 20 and commenced its active existence in 1909.

### Weight Lifting on a Nieuport.

TESTING a two-seater Nieuport, fitted with a 60-h.p. Clerget rotary motor, with an extra load of 280 lbs., Gobe was flying at Pau for 2 hours and 5 mins at a great height. The trial was officially observed by a French military officer.

### Quick Firer on a Farman.

DURING last week, Mr. Henry Farman was testing at Buc a machine he has built for the Russian Government, which has a bullet-proof compartment for the pilot and his passenger and also has a quick-firing gun mounted in front.

### More Farman Activity.

ON Sunday week, Henry Farman on a small trial machine, Maurice Farman on one of his latest biplanes, and Senouque on a Maurice Farman machine, each with a passenger, went over from Buc to Etampes and returned in the evening. Gougenheim, with a friend, went over from Etampes to Orleans for lunch, and Bernard, also with a passenger, starting from Buc, flew over Paris at a height of 1,500 metres.

### Over a Thousand Kilometres in a Day.

THAT is the record of the Farman School, at Etampes, on the 23rd ult. Lieut. Combette made flights of an hour in the morning,

and an hour and three-quarters in the afternoon; van Steyn was flying over the neighbourhood for an hour and a half, while Paret was up quite a long time practising high flying. All the other pupils, including Col. Everett and Lieut. Burroughs, made good flights, and Renaux was busy testing a new Maurice Farman, which has a high turn of speed.

### A Good Trip by Ladies.

COMPETING for the Ratmanoff prize for the longest distance flown by a lady passenger, Mdme. Duchange, secretary of the Stella Aero Club, left Villacoublay on the 23rd ult., on a 70-h.p. Astra biplane, piloted by Madame Pallier. They started off in the direction of Chartres but were much troubled by the strong wind, and eventually landed at Maintenon after covering a distance of about 30 miles.

### Gobe Tries for the Criterium.

AT Pau on the 26th ult., Gobe on his Nieuport set out to better Fourny's record of 1,010 kiloms. for the Aero Club of France Criterium, but after flying for three hours and covering about 300 kiloms., the pilot had the misfortune to lose his goggles and was compelled to land. His machine was fitted with a Clerget rotary motor.

### Issy to Chalons on a Voisin.

RUGERE, on a Voisin biplane built for the French Army, on Monday flew over from Issy to Mourmelon in smart time.

### Montmain a Superior Pilot.

LEAVING Villacoublay at a quarter to ten on Monday morning, on his Astra biplane, Montmain arrived at Orleans at 11.20. He had lunch, and then returned to Villacoublay. The flight was one of the tests for a military *brevet*.

### Another Peugeot Aviette Prize Won.

ON December 21st at the Parc des Princes track, Paris, Paul Didier succeeded in winning the 2,000 francs offered by M. Peugeot for a flight of five metres accomplished by muscular power alone. On his bicycle, to which a pair of small wings were fitted to the front forks and another small plane above the back wheel, he made one "jump" of 5 metres 5 centimetres at a height of more than 2 decimetres (8 inches) and then turned round and flew 5 metres 32 centimetres in the reverse direction.

### Night Flying at Johannisthal.

AN experiment in flying after dark was carried out at Johannisthal on Sunday week, when Bruno Hanuschke made a trip of a quarter of an hour. By the aid of the flares lighted on the aerodrome the pilot was able to make a perfect landing.



The new Curtiss-Paulhan hydro-biplane on which Paulhan has been making some very successful flights on the Seine at Bezons.

# AERONAUTICAL ENGINES.

Paper read by A. GRAHAM CLARK before the Institution of Automobile Engineers.

(Continued from page 1179, December 14th issue.)

## Some Types Described.

TURNING now to the consideration of the details of engine construction:—

The A.B.C. Engines.—The makers of these engines employ a

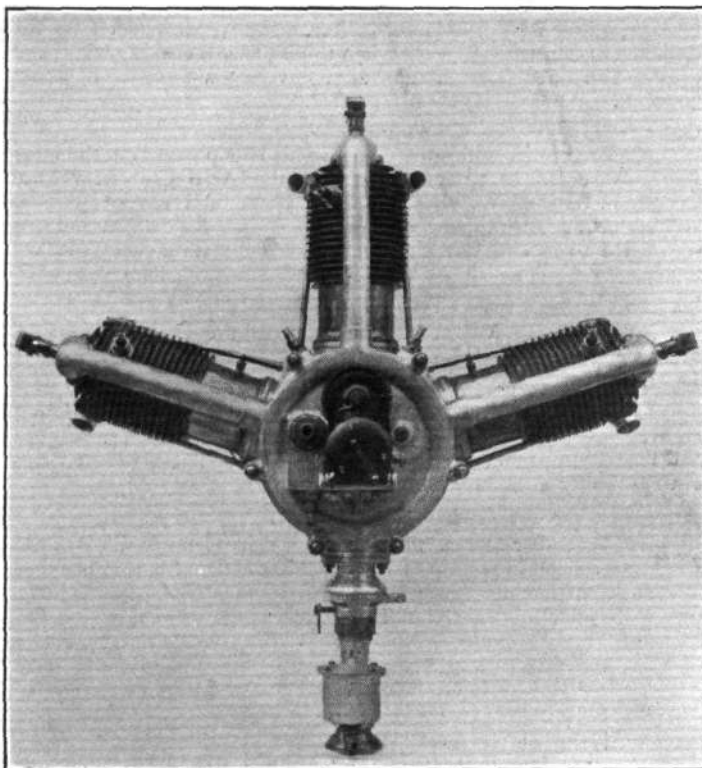


Fig. 1.—30-h.p. Anzani engine.

form of construction which is not at all uncommon in the United States, in that a range of powers is obtained by varying the number of cylinders and by making the crank-case in sections, which are

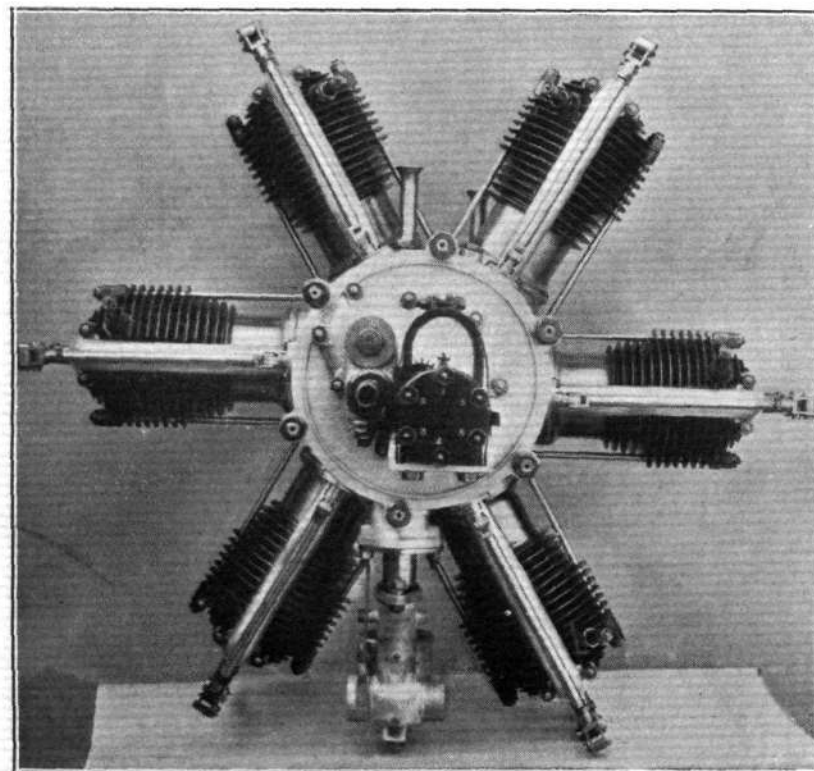


Fig. 2.—45 and 60-h.p. Anzani engine.

spigotted and bolted together. This enables the engines to be produced at a lower cost without the sacrifice of good workmanship and manufacture. At the same time, however, it would appear to involve some sacrifice in accessibility, although in other directions provision in this respect is ample in the A.B.C. engine. The crank-case, of cast steel, is well ribbed on the interior to prevent transverse distortion. The wisdom of mounting the valve levers on the water outlet from the cylinders, which is at a high temperature, is questionable, notwithstanding the large bearing area of phosphor bronze obtained, on account of the difficulty of ensuring the efficient lubrication of the part. The fly-wheel is mounted on a key at the end of the crank-shaft, remote from the propeller. A single cam operates the inlet valves to the two cylinders opposite each crank, and lubricant is carried to the gudgeon-pin through a hole passing up the web of the connecting-rod. If desired, a reduction gear may be fitted and the engines run at a higher speed of revolution; the ratio employed for the larger engines is 2 to 1 and the reduction gear weighs 28 lb., while that for the smaller sizes is  $2\frac{1}{2}$  to 1, and the weight 19 lb.

The Alveston Motor is one of the few engines extant in which horizontal opposed cylinders are employed, although the advantages of such an arrangement in respect of balance are well known. This engine has an auxiliary exhaust. The cylinders are held together by four long vanadium steel rods which pass through the crank-case and through bridge pieces placed over the ends of the cylinders, so that the crank-case is relieved of stress. It will be clear that this ensures a strong, rigid construction, albeit it is open to objection on the score of accessibility, especially in view of the fact that these four rods also support the engine upon the fuselage, and hence the engine has to be removed in the event of examination or repair becoming necessary.

The Adams Farwell Engine has but one valve placed in the head of each cylinder for both inlet and exhaust; it is mechanically operated and opens direct into the atmosphere. Thus the valve is opened at the end of the power stroke and remains open during exhaust and inlet periods. During the suction stroke, the fuel is injected into the cylinder in the path of the incoming air. The system is apparently very simple, but there would probably be some difficulty in controlling the supply of petrol, so that the engine would be extravagant in fuel. The induction of a sufficient charge of air through a valve in the head of the cylinder of a revolving motor is also extremely doubtful.

The Albatross Engine employs two cranks at  $180^\circ$  with each other, while one inlet and one exhaust cam operate the inlet and exhaust valves of all the cylinders, so that the order of firing is 6, 5, 4, 3, 2, 1. Auxiliary

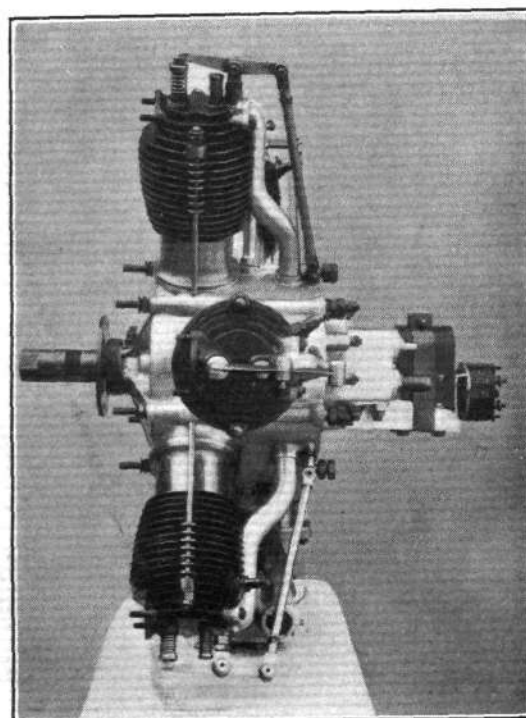


Fig. 3.—45 and 60-h.p. Anzani engine.



exhaust ports are used, and there is a chamber formed on the front of the crank-case into which the explosive mixture is drawn by the engine and from which the inlet pipes are led, for the distribution of the gas to the cylinders, somewhat similar to the arrangement used on the Anzani engines. The makers of this motor do not machine the outside of the cylinder, and claim that by this practice greater strength is obtained, but since the walls cannot be made of excessive thickness in this class of work this claim would appear to be more than counterbalanced by the risk of an unduly thin casting on one side and the distortion produced by the unequal cooling resulting therefrom. Adequate lubrication is a special feature of this engine, no fewer than four pumps being utilised for this purpose, and in order to prevent over-lubricating the inverted cylinders, the casting is extended so as to project into the crank-case itself to the extent of about  $1\frac{1}{2}$  in.

**Anzani Engines.**—Figs. 1 and 2, and Figs. 3 and 4. The principal improvements that have been made in these engines since 1909 have been in regard to the method of valve operation, the use of long bolts for securing the cylinders, the formation of a mixing chamber upon the crank-case, and the employment of helicoidal feet to the connecting rod. Air-cooling is still employed, as is also the automatic inlet valve, but the exhaust valves are now operated by overhead levers as seen in Fig. 3.

The construction employed in these engines for the attachment to the crank is somewhat similar to that on the old Brotherhood engines, in that a central bronze bush is fitted to the crankpin upon which the ends of the rods rest. To secure the parts in position, two clips in halves are bolted together (one on each side of the rod) over longitudinal extensions from the connecting rods. The two forms differ as regards the shape of the connecting rod ends, for whereas in Brotherhood's engine they were made parallel to the axis of the crank, in the Anzani engine they have a helical shape, the object of the latter being to obtain a greater angular contact between the rod and the bush.

The inlet pipes are now placed at the back of the cylinders on account of the strong cooling effect produced at high speeds in their former position.

In addition to the types of engines illustrated in Figs. 1 to 4, there is one other—the military type or V engine—in which three cylinders are arranged at an angle of  $120^\circ$ , though in all other respects it is similar to Fig. 1. The cylinders of these engines are

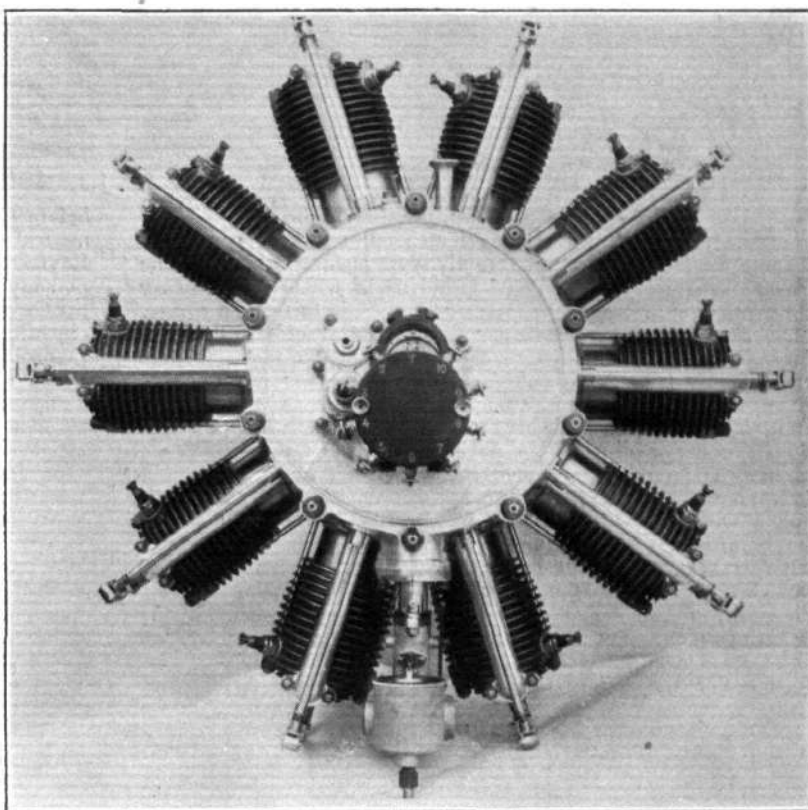


Fig. 4.—80 and 100-h.p. Anzani engine.

offset with relation to the crank-shaft. The large wind resistance area offered by the class of engines in which the cylinders are arranged about the crank-shaft is obvious by an inspection of Fig. 4. Attention may also be drawn to the high speed at which it is necessary to drive the armature of the magneto (should a single magneto be employed) with a large number of cylinders. In the 10-cyl. Anzani, the armature must be run at  $2\frac{1}{2}$  times the speed of the engine.

(To be continued.)

#### Servian Royalty Flying.

ON December 20th, the Servian aviator, Agasonoff, made three flights over Uskub being accompanied by the heir-apparent to the Kingdom of Servia. The soldiers and the crowd gave the pilot and his Royal passenger an enthusiastic reception on landing.

#### Cross-Country Flying in Roumania.

ON the 16th December, Lieut. Capra on the Blériot flew from Bucharest to Braila, a distance of 180 kiloms., in two and a-half hours, while Vacas, on a Farman, took three hours for a similar trip. They then gave an exhibition of flying, resulting in the raising of about £400 for the National Fund. Afterwards Lieut. Capra returned direct to Bucharest, while Vacas commenced a tour of the country.

#### Another Casualty in the Balkan War.

ON the evening of the signing of the armistice, Constantine de Mazurkiewitch, a volunteer aviator with the Bulgarian Army, was wounded by the Turks while flying over the Tchataldja lines. He managed to get his aeroplane back to the Bulgarian lines, but died soon afterwards.

#### A Volunteer Corps for Germany.

THE proposal of the Imperial German Aero Club to organise a Volunteer Flying Corps appears to be taking shape, and a scheme has been submitted to the Military authorities. This provides an annual grant of £150 to the pilot in addition to £2 for daily expenses and £10 to cover the cost of transporting the machine. It also allows for a pension of £1 per day to be paid to the dependents of any volunteer airmen killed in service.

#### An Aerial Honeymoon in Germany.

AFTER his wedding on Sunday week, Herr Gustav Otto, the German aeroplane builder, mounted his machine, near the registry office, and, with Baierlein as pilot, flew with his bride across Munich, landing just by the home of some friends in the suburb where the wedding breakfast had been prepared. Herr Otto plans to have an aerial honeymoon if the weather is favourable.

#### A German Flyer in France.

SOME surprise was occasioned at Marmay, Haute Saone, on the 19th ult., by the landing of a German non-commissioned officer named Zippa, who explained that, while flying from Mulhausen, he lost his way in the fog. After being detained for some time, while enquiries were being made, he returned by train with his machine to Mulhausen.

#### And a French Pilot in Germany.

ON the 28th ult. a biplane from the Nancy garrison, piloted by Lieut. Glaize, accompanied by another officer, was forced, through failure of the motor near Avricourt, to land on the German side of the frontier. After explanations the officers were permitted to return with their machine by train.

#### A German Fatality.

AFTER making a flight in the neighbourhood of Mayence, Lieut. Dransfield's machine was capsized when trying to land. The pilot was thrown out, and injured his skull so severely that he died almost immediately.

#### An Aeroplane to the Rescue.

PRACTICAL use was made of the aeroplane in Morocco on the 22nd ult. A column of 500 French troops had been surrounded by rebels to the south of Mogador, and for five days some anxiety was felt for their safety. It was then that Lieut. Dohu, on his Blériot monoplane, was able to convey information to the Commander that reinforcements were close at hand. A week later Lieuts. Dohu and Perret made a 25 mins. reconnaissance along the Tedzy Valley, while Lieut. Van den Vaero and Fierstein flew over from Casablanca to Tangier, the trip taking 2 hrs. 50 mins.

#### Wilhelmshaven to have Air Station.

It is stated that the German naval authorities have decided to establish an aviation centre at Wilhelmshaven on the North Sea, and that it will replace the one temporarily started at Putzig, where the Government have been experimenting with various types of hydro-aeroplanes for some time.



## Models

Edited by V. E. JOHNSON, M.A.

### Rocket-Planes and Gunpowder Motors.

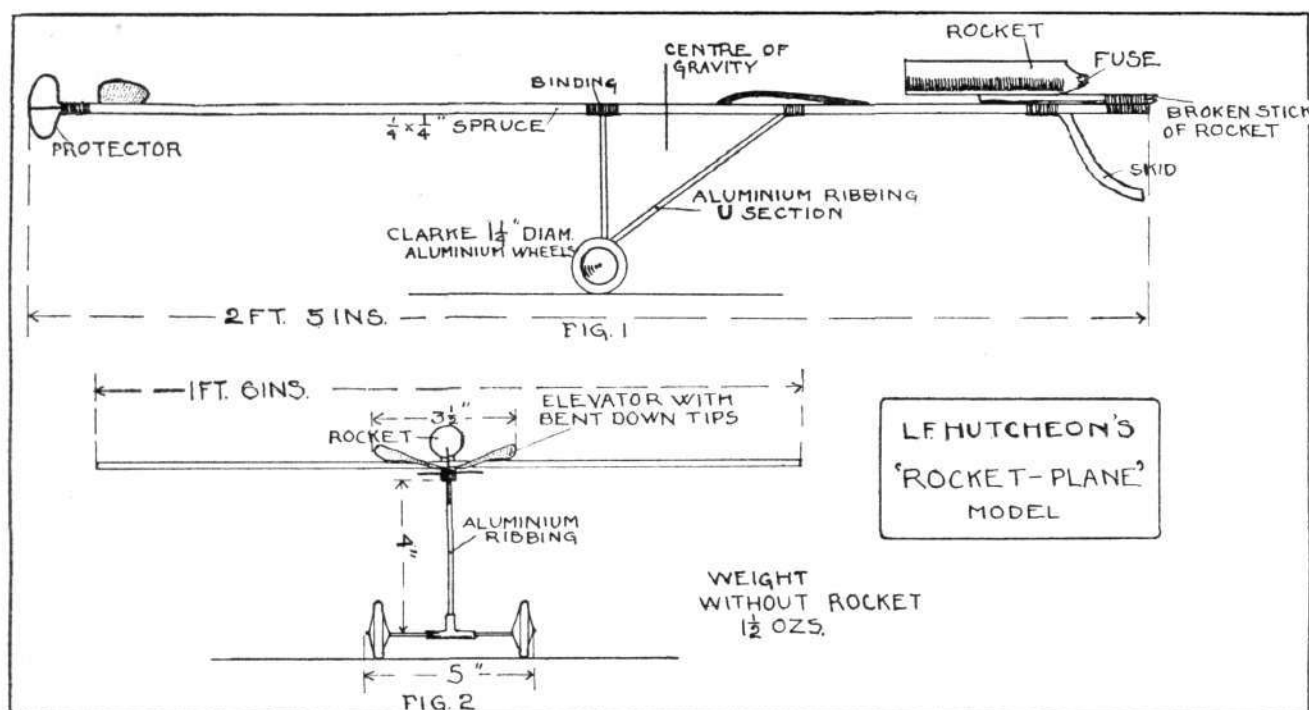
A CORRESPONDENT, Mr. L. F. Hutcheon, sends us particulars of some experiments he has recently been making with what he terms rocket-planes, *i.e.*, a model aeroplane in which the ordinary rubber motor is replaced by a gunpowder one—in this case a rocket.

He says: "When reading 'Replies in Brief' in FLIGHT, November 16th, 1912, I noticed the suggestion put that a certain person should try a 'rocket.' Thinking the matter over, I came to the conclusion that the idea might be a really feasible one. The result was that I fitted up a very light model, shown in Figs. 1 and 2, without rubber or propellers, and with the head of a rocket fitted on behind. The model was taken across to a field, and a roll of oil-cloth spread out. The first trial was a failure owing to the model running off the oilcloth. The second also failed owing to too little elevation. The third rose in about 4 ft., and flew about 20 yards, only descending because it had been switchbacking on account of over elevation. My stock of rockets (price 3 a penny) being exhausted, and it being early closing day, my experiment had perforce to stop. But my firm belief is that the model, when fitted with a more powerful rocket and correctly elevated, would traverse a distance of 300 yards. A point about cheap rockets is that they

before the Wright Brothers had thought out and invented their method of launching aeroplanes, so eminent a scientist as Lord Rayleigh proposed the principle of the rocket as one that could very possibly be employed for initial launching purposes, and in the past, Sir George Cayley (a man about a hundred years ahead of his time) experimented with a gunpowder motor. So far as the present or immediate future is concerned, the only case in which it might be of use is in experiments relative to the launching of hydro-aeroplanes. One of the chief troubles in launching a hydro-aeroplane is the thrusting down of the nose due to the high centre of thrust of the propeller.

Hydro-aeroplanes, if sufficiently powered, invariably leave the water once they can be got to hydroplane. We are quite sure that a series of very interesting and possibly valuable experiments might be made with a couple of dozen penny rockets and a suitable model. The experiments, say, to take the nature of an investigation to determine the effect of an alteration in the height of the centre of thrust in relation to the launching of the model.

When we desire to obtain anything in the nature of a flight (of any duration), we should, I feel sure, have to use larger rockets; the flight of larger rockets being comparatively slow with respect to



do not explode at the termination of their sparks, &c., a decided gain. An advantage about a rocket-plane is that the fuselage need not be over strong, as the strain and torsional forces of the rubber are entirely done away with. Also since there is no torque, &c., the flight path is far more likely to be a straight one. I hope to experiment more with this type of motive power."

Commenting on the above communication, a certain number of experiments have been carried out with model aeroplanes in which the motive power was a rocket. Nearly three years ago I made a few experiments, and so far as I remember the best results was a flight of 150 yards. The rockets used were penny ones. In one of the early K. and M.A.A. competitions at the Crystal Palace one of the competitors turned up with a "rocket-plane," to the great disgust of the other competitors, whose language and remarks *re* the same were, we distinctly remember, far more forcible than polite. The machine made but one flight of great height, and about 100 yards in length, ending its career (to the great joy of all the other competitors) by plunging head first down on to the hard stone bottom of an empty fountain basin, and smashing itself to "smithereens." Since that time I have never seen a rocket-plane in any competition. Nevertheless it by no means follows that some use might not be made of it in aeronautical work. Many years ago,

those of smaller size. The flight, for instance, of a  $\frac{1}{2}$  lb. or 1 lb. rocket is quite majestic with regard to height and beauty of ascent. The small ones are certainly much less suited in this respect, there being too much in the nature of an initial burst off, a rush, and all is over.

As the ingredients of the rocket composition are consumed the weight naturally becomes less, and therefore the rocket should be attached at the centre of gravity of the machine, if possible. We should also have the centre of thrust or reaction pass through the centre of pressure. In fact, owing to the extremely energetic nature of the motive power, it is, perhaps, even more important than usual, that the centres of gravity, of head resistance should be coincident, and the propulsive action of the rocket pass through this same point. The rocket is not the only form of gunpowder motor that has been designed, and even put on the market for models. We have in our possession one on the turbine or Catharine-wheel principle, *i.e.*, a rotary one to which a propeller can be attached. We have not been able to obtain any satisfactory results with it, however; more than one reader can no doubt call to mind that Catharine wheels of very small size are, generally speaking, very successful, but the larger sizes quite the reverse, and the above-mentioned motor appears to be no exception to the rule.

Another form which the motor might take is that of a Saxon, or as it is more generally termed, Chinese flyer, in which the actual screw or propeller-blade and boss was hollow, with suitably placed orifices at the side of the tips, the hollow being filled with the proper composition. Our personal Guy Fawkes' Day experiences with Chinese flyers is that they are almost invariably successful, more especially if of the double Saxon type, *i.e.*, where the fiery jet issues from both ends simultaneously. Naturally it lasts only half as long, but is twice as powerful while it does last.

It may be perhaps just worth while mentioning that if anyone can secure a flight of over half a minute's duration with any of the above types, or indeed any type of gunpowder motor, he undoubtedly becomes eligible as a competitor for the power-driven model contest at the Olympia Show next February. The greatest difficulty appears to be the discovering (by actual experiment, in all probability) the most suitable composition, to give as lasting, steady and powerful a jet as possible. Gunpowder itself is a mixture of charcoal, sulphur, and nitre, the latter constituting three-fourths of the weight. The nitre supplies the oxygen for the combustion of the charcoal, which is converted into carbonic acid, and the sulphur, which is added to increase the rapidity of the combustion, is also oxidized. The products of the action are both numerous and complicated, but the important result so far as we are concerned is the sudden generation of a quantity of carbonic acid, nitrogen, carbonic oxide, hydrogen and other gases, which at the oxidizing temperature and pressure of the air would occupy a space 300 times greater than the powder from which they are set free, but the intense heat attending the chemical action greatly dilates the gases, so that at the moment of explosion or combustion they occupy a space at least 1,500 times greater than the gunpowder. The fineness to which the ingredients are ground has an important bearing on the rate of combustion. It is these dilated gases throttled more or less by the "choke" rushing out through the choke-hole which, on the principle of action and reaction being equal and opposite, propel the rocket in an opposite direction. A rocket containing a pound weight of charge will rise from 300 to 600 yards in the air, large rockets from 800 to 1,200 yards.

The reader must not conclude from the above that we are advocating "rocket" motors for model aeroplanes—we merely wish to place a few quiet unbiassed facts before our readers, leaving them to draw their own conclusions; this type of motor possesses one point in its favour, which we have so far omitted to state, and that is that in a model propelled by such the weight can be distributed similarly to that on a full-sized machine.

#### Scientific Model Building.

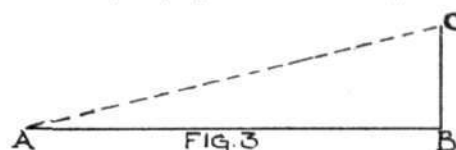
##### IV.—Propellers, their Design and Construction.

The design and construction of propellers is, without doubt, one of the most difficult, as it is also one—if not *the* most important part of model aeroplaning. The function of a propeller is to produce dynamic thrust, and the great advantage of the use of a propeller as a thrusting or propulsive agent is that its surface is always active. It has no dead points, its motion (unlike that of flapping wings) is continuous and not reciprocating, and it, therefore, requires no special mechanism in its construction and operation. It should always be borne in mind that a propeller is nothing more nor less than a particular form of aeroplane; it may, in a word, be regarded as a monoplane whose wing-tips have an extreme warp. Similarly, the converse is also true that we may regard a monoplane wing as a propeller of infinite radius and infinitely fine pitch. (Questions of aspect-ratio, stream-line form, plan form, positive and negative pressure, &c., affect propellers in very much the same way that they do wings, and the question of the "dipping front edge" also enters into the construction of propellers just as it does into that of wings or aerocurves.)

Since all the power of a motor is supplied through the propeller, it at once follows that the efficiency of any machine as a whole must depend as a whole on the efficiency of its propeller or propellers,

supposing more than one is used; we propose, therefore, dealing with the subject at some length.

The pitch of a propeller is the linear distance the propeller moves, backwards or forwards, in one complete revolution. In Fig. 3, the line, AB, represents a linear distance equal to the travel of the blade-tips *i.e.*, the diameter of the propeller  $\times \frac{22}{7}$ . The dotted line, AC, the theoretical course of the propeller-blade during one revolution; the perpendicular line, BC, represents the consequent pitch. The



reader will probably obtain a clearer idea of this by cutting out a piece of wedged-shaped paper similar to ABC; of such a size as to just meet when wrapped round some convenient cylindrical object, *i.e.*, for A to just reach to B; AC then forms a spiral or helix, *i.e.*, a screw. If a horizontal radius is kept in contact with this spiral, AC, it will sweep out a spiral surface as it rotates around the centre of the cylinder. A propeller is a part of such a surface. Theoretically, of course, a propeller need have but one blade, but practically more than one must be used, owing to lack of balance, &c.

This distance is, however, a purely theoretical one. When such a propeller screws itself forward the air yields and slips away. Theoretically, if we state that such and such a propeller has a pitch of 1 ft. or 12 ins., we mean that the model would advance 1 ft. through the air for each revolution of the propeller; this is only true, however, if it were mounted in solid guides like a nut on a bolt with one thread to the foot. In a yielding fluid-like air it does not practically advance this distance, and hence occurs what is known as:—

**Slip**, which may be defined as the distance which ought to be traversed, but which is lost through imperfections in the propelling mechanism, or it may be considered as power which should have been used in driving the model forward. It should be noted that in the case of a motor car running on a good hard, dry road nothing is lost in slip, since there is none. In the case of a model aeroplane held stationary whilst the motor is allowed to run down and drive the propeller in so doing, all the power is used in slip, *i.e.*, in putting the air in motion, and none in propulsion or driving or dragging it forward.

Let us suppose the propeller on our model has a pitch of 1 ft., and we give the rubber motor 500 turns, then theoretically it should travel in calm air 500 ft. before the propeller is run down; no propeller yet designed will do this; supposing the actual distance 385 ft. then 23 per cent. has been lost in slip. For this to be actually correct, the propeller should stop at the precise instant that the model comes to the ground.

Taking "slip" into account,

The speed of the model in feet per minute = pitch (in feet  $\times$  revolutions per minute) — slip (feet per minute).

Or briefly put—

Theoretical speed = pitch  $\times$  r.p.m.

Actual speed = pitch  $\times$  r.p.m. — slip.

This slip wants to be made small, just how small is not known. If made too small the propeller will not be so efficient, or, at any rate, such is the conclusion come to in marine propulsion, where it is found most economical results are obtained when the slip is from 10 to 20 per cent. In aerial propulsion there are some reasons for assuming that about 15 per cent. may be the best. While it is true that slip represents energy lost, some slip is essential, because without it there would be no "thrust," this same thrust being derived from the reaction of the volume of air driven backwards.

(To be continued.)

## NOTES ON PAPER GLIDER EXPERIMENTS.

By G. H. KILSHAW.

[This contribution has been awarded the first FLIGHT Certificate of Merit. See pages 12 and 13.]

### PART I.—Dihedral and Incidence Angles.

A REVIEW of some recent experiments of mine in natural stability may be of interest to others who conduct such researches.

Paper gliders formed the subject of the experiments in question, which proved highly interesting.

Four gliders were made from a stiff cartridge paper, and to ensure each being of the same shape and dimensions, they were cut in one from a sheet folded into quarters. The accompanying sketches and descriptions clearly show their appearance and characteristics.

Each glider was subjected to three tests as follows:—Test I, launched level; Test II, launched at an angle of 45° over to left wing; Test III, released with wings vertical without forward motion

as a test to side-slip, and the following results were obtained:—

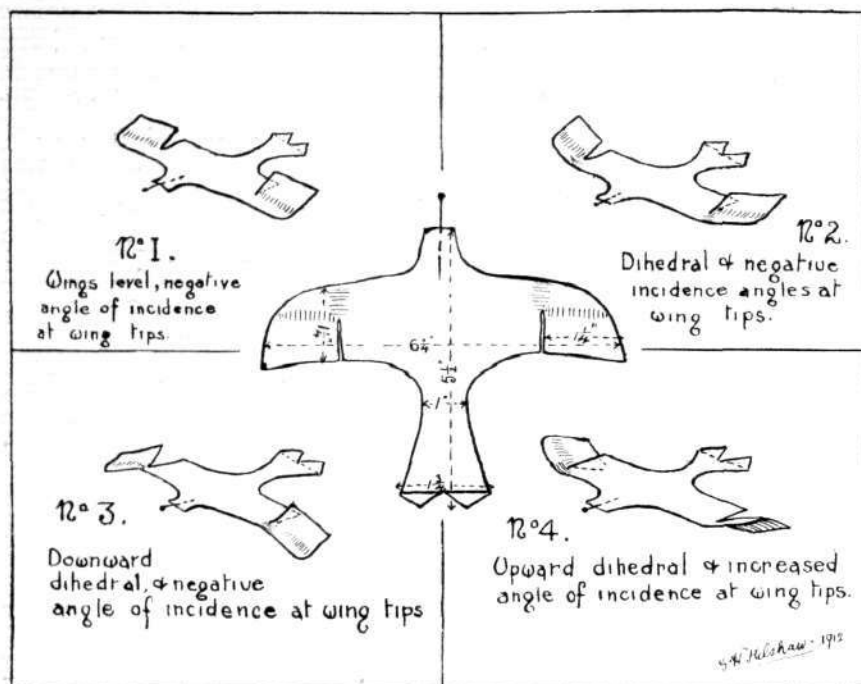
Glider I.—Test I, very good stability; Test II, turned to left, slight oscillations, gradual recovery to level; Test III, side-slip and nose-dive before gliding.

Glider II.—Test I, good stability; Test II, turned to left, oscillating badly but gradually diminishing; Test III, oscillated badly, followed by a nose-dive.

Glider III.—Test I, good stability; Test II, quick recovery but overturning to right wing; Test III, completely overturning, landing upside down without gliding.

Glider IV.—Test I, excellent stability; Test II, steady turn to left; Test III, quick recovery and nose-dive before gliding.





## KITE AND MODEL AEROPLANE ASSOCIATION.

### Official Notices.

#### British Model Records.

Hand-launched ...	{ Distance ...	A. E. Woollard ...	477 yards.
	{ Duration ...	A. F. Houlberg ...	89 secs.
Off ground ...	{ Distance ...	G. Rowlands ...	232 yards.
	{ Duration ...	A. F. Houlberg ...	51 secs.
Hydro, off water ...	{ Duration ...	G. P. Bragg-Smith ...	25 secs.
Single-tractor screw, ...	{ Distance ...	H. R. Weston ...	84 yards.
hand-launched ...	{ Duration ...	F. W. Jannaway ...	22 secs.

**Affiliation.**—The Bristol and West of England Aero Club (Model Section) have applied for affiliation. Other clubs that are not yet affiliated should send in their applications at once, so that their members can avail themselves of the privileges, which are, viz.: 1. Half entry fee to all competitions; 2. Reduced fees for registration of model performances; 3. Attend all meetings of the Association; 4. Take part in discussions; 5. Introduce guests to the Association's meetings and discussions other than those of a business character. The affiliation fee is only *10s. 6d.* per annum.

**Official Observers.**—The council will be pleased to consider applications for the appointment of official observers for districts outside the London district. Any such applications should be forwarded to the hon. secretary, giving the necessary information as to qualifications, &c. Any club applying should state if the club has an anemometer and the necessary appliances and instruments for use in official trials.

**Notice to Members.**—All members are reminded that their subscriptions for the ensuing year should be forwarded to the hon. secretary, as all those who intend exhibiting at Olympia must note that they must be paid when their application forms are sent in so that they can obtain the special advantage of reduced fees for exhibiting. Application forms will be forwarded to any reader wishing to become a member, on application.

**Official Trials.**—All applications for entering these trials on the Aero Models (Northern Branch) ground, at East Finchley, on Saturday, January 11th, should be forwarded to the hon. sec. at once. It is hoped that some of the record holders will attempt to beat the existing ones.

27, Victory Road, Wimbledon, S.W.

W. H. AKEHURST, Hon. Sec.

## MODEL CLUB DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

### Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

JANUARY 11TH, K. and M.A.A. trials for records, at Finchley, 2.30 p.m. The club has decided to take a stand for exhibits at the Olympia Show in February. All intending competitors are asked to advise the secretary, and a start should now be made with all the show machines. As the number of machines to be exhibited is limited to eight, there will, if necessity arises, be a judging of the models, and certain of them eliminated. Full particulars for exhibiting can be obtained, upon application, from the secretary.

**Monthly Report.**—November 30th, several members out with tractors at Finchley, Mr. Weston and Mr. Hindsley both proving the air-worthiness of their machines in the high wind. Messrs. Fletcher, Ross, Jones and Brown were also making flights, but with 0-1-1-2P types, the best duration being accomplished by Fletcher, with 53 secs. Other members flying, but with indifferent success. December 7th test flights, &c., were made prior to the K. and M.A.A.'s trials for the 14th. Mr. Fairy was present, and according to the behaviour of his machine there was apparently a bad down-wind which allowed of no altitude being obtained. However, he got in some good straight flights of some 300 yards. Mr. Hindsley was out with his now very antique, but, nevertheless, very capable, tractor, and made several flights of 100 yards and more, despite the wind. Mr. Fletcher, owing, no doubt, to propeller trouble, experienced considerable difficulty with his new tractor. Mr. Jones' Enfield machine, with which he did so well, was making some rather nice flights, but were always low. December 14th, the day for the K. and M.A.A.'s trials, brought along a wind averaging 46 m.p.h.,

Each glider was launched four times in each test, to ensure proper observation, and the superiority of No. 4 glider over the rest was most marked.

The real instigation of these experiments occurred while seeking to design a machine of a combination of well-known stable wing forms. Such a machine is No. 2 glider, and it is a singular case of how such a combination may prove useless. On a banking movement taking place, it will be found that the downward pressure caused by the negative angle of incidence at the wing tips are increased by the dihedral on the lowest wing, the opposite effect to that required of a stable machine.

It was on this reasoning that No. 3 glider with reversed dihedral was designed, since, as the machine banks, the negative pressure of the highest wing is increased, producing the desired downward thrust. This machine, however, suffers from an overturning inclination during a side pressure during a wind gust, side-slip, or steep banked turning.

No. 4 glider, being the complete reverse of 3 in having upward dihedral and the angle of incidence greater at the wing tips than the centre portion of the main plane, gives a greater righting movement than if the incidence were the same all along the plane.

My next experiments will be to add to the last type of glider anything that shall be found best to prevent the nose-diving after a very steep bank, without interfering with its present good stability, prior to building large propelled models of its type.

so that, after consideration, the two observers, Mr. Akehurst and Mr. Fairy, declared them void, and arranged to postpone them till January on the same ground. Mr. Weston managed to get his twin-propelled biplane well away twice, thus providing some rather spectacular flying. December 21st, at Finchley, there was a very good crowd of members, but the best flying of the afternoon was undoubtedly provided by Mr. Hindsley with his tractor mono. This machine frequently covered the greater part of the distance across the ground, with durations varying from 25 to 35 secs. Mr. Hindsley had re-surfaced the main plane (which is double-surfaced), and the success which he obtained was very likely due to this. Messrs. H. E. Fletcher, B. Brown, E. R. Jones, and G. O. Partridge were giving very creditable performances with their various machines.

### Colwyn Bay Model Aero Club (3, HILLSIDE RD., COLWYN BAY).

THE committee on the 23rd inst. accepted the resignation of the joint-secs., Messrs. Bradley and Hall. Mr. Smethurst being elected in their place.

**Monthly Report.**—Quite an interested crowd witnessed a meeting held on the promenade on Boxing Day. F. Jackson, 1-1-P1-0 r.o.g., obtained good short flights. D. Allen, 1-1-P1-0 r.o.g., flying low. Although too windy for hand-launched machines, J. Smethurst put in good flight with his 1-1-P2-0. All communications to be addressed to "Secretary," 3, Hillside Road, Colwyn Bay.

### Croydon and District Aero Club (Sec., 136A, HIGH STREET).

**Monthly Report.**—Although the weather has not been favourable during December, a fair amount of flying has been done. A notable performance was a flight by Mr. D. Pavely's tractor monoplane, built up fuselage, of 115 yards. This model flies with its tail "well up" and is very stable. Other tractor models have been made by Messrs. Bell, Thumwood, Mullins, Carter and Hart, and fair results have been obtained. Mr. Hart's large r.o.g. monoplane has also performed well, but owing to a slight warp on the planes, flies in circles. However, this has now been corrected. A very fine scale model Caudron biplane has been constructed by Mr. C. Smither, and another fine tractor monoplane by Mr. D. Pavely. Mr. Minot, a new member, is constructing a 5-ft. span hydro-monoplane, and we expect great things from it. Mr. P. Hart is constructing a hydro-biplane of the Burgess type, but with Caudron pattern planes. Several new members have joined, and with "Xmas funds" coming in, a glider will be made for the new year. In fact, things are very "bright" for 1913.

### Leytonstone and District Aero Club (64, LEYSPRING ROAD.)

FLYING, week-end as usual.

**Monthly Report.**—The last month has seen a decided advance in the class of models, and tractors and r.o.g.'s are now rather the rule than the exception. The weather throughout the month has been very discouraging, consequently the attendances have not been large, although on several occasions Messrs. Louch, Bond, Gittus, Marmim and others of the late Hackney and District Aero Club helped to swell our numbers, Mr. Bond making the best flight of the month with 81 secs. and out of sight. The construction of models for the coming exhibition at Olympia is claiming a good deal of attention in the workshop, so that, although comparatively little flying has been done, the indoor energy during the month looks well for the near future.

### Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

**Monthly Report.**—The work of members during December has been almost entirely confined to designing and procuring the necessary materials for the models to be constructed for the forthcoming aero show at Olympia, Mr. V. E. Johnson's lecture on hydro-aeroplanes on December 28th was successfully carried through, much valuable information on this subject being gained by the audience. The 70 lantern slides illustrating the lecturer's remarks were depicted on the screen exceedingly well by Mr. H. W. White. The annual general meeting of the club will be held probably on Saturday, January 18th, when a full attendance of members is requested.

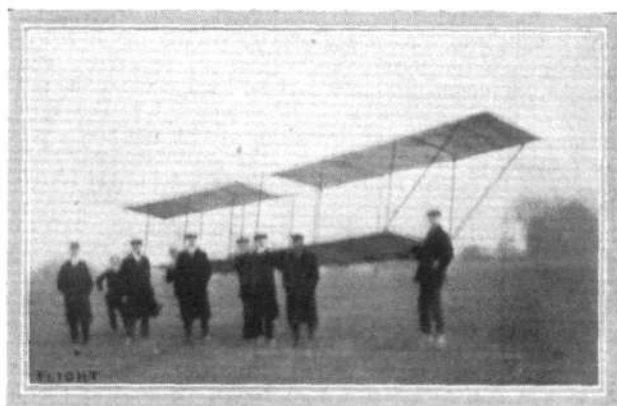
### S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

JAN. 4TH, at Kidbrooke, 2 p.m. to 4.30 p.m. Jan. 5th, at Blackheath, 7.30 a.m. to 10 a.m.; at Woolwich Common, 10.15 a.m. to 12.30 p.m.; at Chislehurst, 2 p.m. to 4.30 p.m., on the Common and Cricket Ground (by members of the Chislehurst and District Aero Club).

**Monthly Report.**—During the past few weeks the members of this recently formed club have put in a considerable amount of serious work in spite of the wretched weather which has prevailed during the greater part of the time, and which has not been "quite the thing" for the type of models chiefly in evidence, viz., tractor monoplanes and biplanes, the majority of which are fitted with built-up fuselages and substantial landing chassis. Mr. A. D. Nichols has



requently been out with his rise-off-ground twin-propeller monoplane, and also with a r.o.g. tractor biplane which has "staggered" planes with flexible trailing edges. Mr. G. H. Westwood has been flying his very original twin-screw self-rising monoplane, which exhibits remarkable speed. Mr. Westwood's tractor mono. (r.o.g., two-bladed screw) has also made some good flights, and Mr. C. H. Morgan has been testing a triple-propeller monoplane and a tractor mono. with four-bladed screw. The former still requires adjustment, but the tractor is now capable of making splendid flights. Mr. A. F. Chinnery has been very active during the month, making excellent flights with a gull's-wing tractor mono. (two-bladed screw), and later with a tractor biplane which has been considerably improved by the addition of extensions to the upper plane. These extensions have a dihedral angle of about 1 in 10, and greatly enhance lateral stability. Mr. F. Plummer has made some splendid flights at Kidbrooke and Mitcham with his numerous models, which include two tractor monoplanes and a large "racing" machine which covers an enormous distance. The stability and general flying of Mr. Plummer's 4½-oz. tractor are excellent. Mr. C. A. Rippon has been conducting many experiments with tractor monoplanes, one of which was fitted with a single screw and twin-motors, and others with the more conventional single skein of rubber. The latter appear to be more reliable and as efficient as the former. At Mitcham Common, Dr. McMunn has made some huge flights with his 4-ft. "racing" mono. Mr. F. Peter's tractor, which is now fitted with a four-bladed screw, has also been flying well at Blackheath and Kidbrooke, and Mr. E. Hoch at Crofton Park has been using his usual types of small models. Mr. R. Prance and Mr. E. Campbell with their r.o.g. monoplanes have done good work at various grounds, and at Blackheath Mr. Prance's "Deperdussin" type has been flying exceedingly well on several occasions. Mr. G. Brown and Mr. W. R. Halnan with "racing" models, and Mr. L. Brough with a twin-propeller biplane (upper plane staggered backwards) has made long and high flights at Blackheath and Peckham. Members of the Chislehurst and District Aero Club have been particularly active with tractors lately, and some fine flights have been made by Messrs. R. Dodd, F. Packham, S. Dodd, and A. Kemsley, and flights of about 100 yds. are frequently made. This club—which is the local branch of the S.E.M.A.C.—propose holding a competition for r.o.g. tractors at an early date, so considerable progress is likely to be made with this type of model, which is now the most popular type in S.E. London. The secretary has been flying his well-known tractor monoplane, "A.B.C. 76," and also his tractor hydro-biplane, which is now converted into a r.o.g. type. These are fitted with four-bladed screws, and the biplane, which weighs 8 ozs., promises to rival the mono. with a little further tuning-up. The four-bladed screws are catching on owing to the remarkable steadying effect they have on tractor models. There is plenty of room for new members, and the sec. would like to get into communication with anyone interested in model aviation—particularly the scientific aspect—with a view to forming branches in the various districts.



The Windsor Model Club glider which has now been fitted with extensions.

#### Sheffield Model Aero Club (35, PENRHYN ROAD, SHEFFIELD).

HAND-LAUNCHED "duration" contest for month; winner, 2s. 6d. or bronze medal. Total entrance fees at month end of 1d. received each week for best added duration flights as second prize. The first contest commences on Saturday, January 4th, at 3 p.m. prompt, and continues every Saturday at "The Standhouse Aerodrome" Intake, opposite Manor Castle, second field.

#### Stony Stratford and District Aero Club (OLD STRATFORD).

Monthly Report.—An Annual General Meeting and Exhibition of Models was held in the Public Hall, on December 18th last. The balance sheet and annual report were presented and unanimously adopted. Mr. J. J. Atkinson, C.C., was again elected president; Mr. O. Hamilton, junior, secretary and treasurer; Mr. R. W. Elmes, assistant and ground secretary; Mr. T. A. Moore, chairman. The following were elected as members of the committee, Messrs. Brown, Benbow, Haseldine and Lawson. Meetings have been arranged for once a month, and members will be advised of day, date, &c., by postcard. All subscriptions are now due. The secretary would be obliged if members would remit as soon as possible.



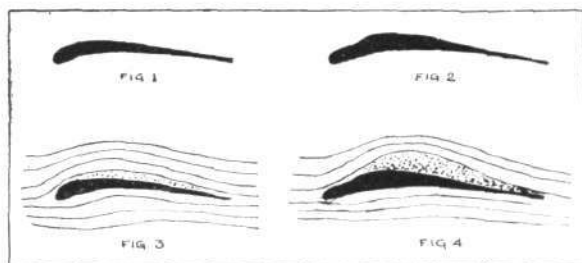
## CORRESPONDENCE.

\* \* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which have appeared in **FLIGHT**, would much facilitate ready reference by quoting the number of each letter.

#### Wing Sections.

[1696] I would be pleased if you would publish the following. I have read in several books that on a wing section as in Fig. 1 on



upper curve on rear part of plane there is a partial vacuum. If this is so, why do not constructors increase the vacuum because it is stated to give additional lift as in Fig. II, because the concave front edge would reflect the air with more violence than in Fig. I. As in Figs. III and IV, this ought to (according to books on aerodynamics) increase the lift of plane. If so, why is it not used on aeroplanes now?

Folkestone.

A. M. O'NEIL.

#### Some Questions and Answers.

[1697] Can you give me some information on the following points?—

1. How to find the area of a cambered surface?
  2. How to find lifting capacity relative to area?
  3. How to determine loading?
  4. How to find the centre of gravity?
  5. How to find the centre of pressure?
  6. What is slip?
  7. What is the best camber and distance of highest point back from leading edge?
- Cricklewood, N.W. C. D.
- [1. The area is usually taken as the span multiplied by the chord.

2. The lift depends on the angle of incidence and velocity, and is determined by experiment for any given section.
3. The loading is determined by the angle and the speed desired for flight.
4. The C.G. is usually calculated, but some idea of its approximate position in a model can be obtained by balancing it on a thread.
5. When the model flies in balance, the C.P. is in a vertical line with the C.G.
6. Slip is the difference between the real rate of advance of the aeroplane and the virtual rate of advance corresponding to the pitch multiplied by the revolutions of the propeller.
7. The best camber and distance of maximum camber need to be determined by experiment for various wing sections.—ED.]

#### Ammonia Gas for Dirigibles.

[1698] This idea comes from Charles Tellier. You are probably acquainted with ammonia gas. Its density is 597/1,000, the air being 1. Its ascensional power is 530 grammes per 1 cubic metre. It is incombustible, and is liquified at a pressure of 6½ atmospheres. Charles Tellier proposed to employ his gas instead of hydrogen.

Two difficulties: the gas destroys textures and its smell is suffocating. But we have special materials (such as Emaillite) which protect the texture, and the gas cannot penetrate with the same facility as hydrogen.

The dirigible can ascend without losing ballast, and descend without losing gas.

We know the absorption of gas ammonia by water (600 litres gas by 1 L. water 15° C.). If the dirigible ascends we can absorb by water ammonia, and the diminution of ascensional power stop the movement. If we descend we can with a little fuel heat the water, and the absorbed gas is evolved. The dirigible can remain in the air as long as required, ascend or descend, profit by favourable wind at any altitude, in order to economise its motive power. The gas is incombustible.

Ballast being suppressed and replaced by machinery, the airship is as rapid as the hydrogen airship. But it can more easily be supplied with ammonia, and it is cheaper.

The ammonia gas is liquified easily, and can be carried by the airship itself, in steel recipients (not very heavy). If the dirigible is torn or damaged it can receive a fresh charge of gas, and continue its way.

ANDRÉ MAS.

